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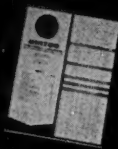
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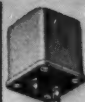
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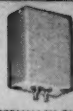
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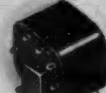
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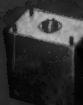
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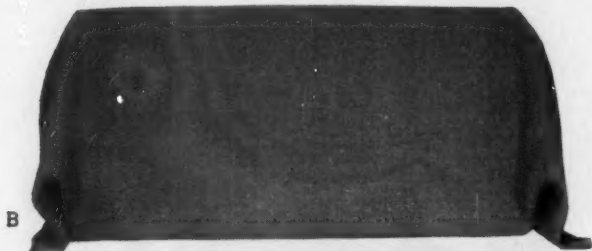
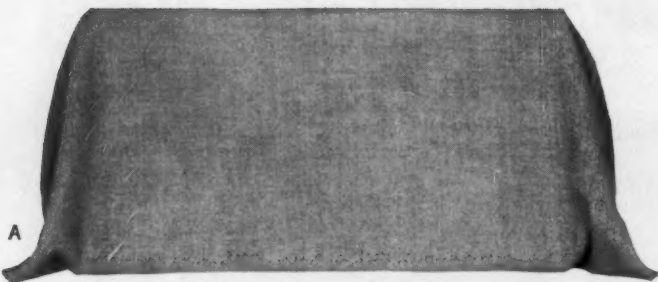
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**Based on a survey of prices for 1955 and 1961 in two national amateur magazines. A and B are both well known receivers, covered for obvious reasons.*

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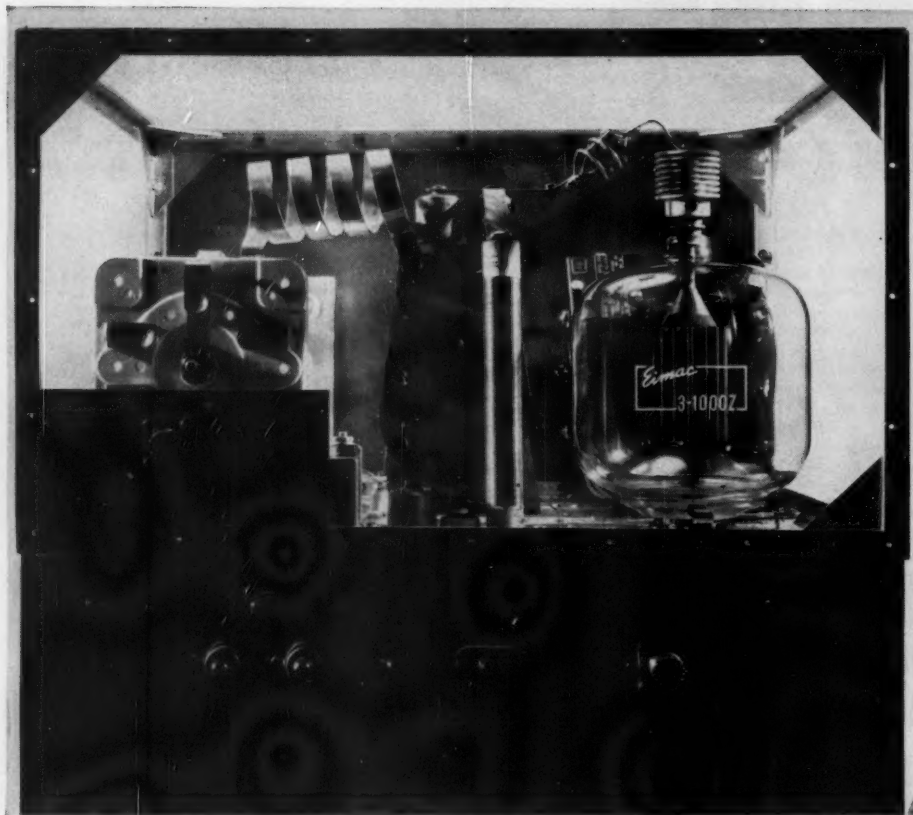
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Who's in back of this amplifier's top signal performance?

Eimac, of course, with its new 3-1000Z zero-bias triode you see at the right. This tube is designed for 2000 watts peak-envelope-power and superior signal-to-distortion ratio in grounded grid service: better than -35db odd-order product suppression. And all this is realized on a plate potential of only 2500 volts! The 3-1000Z thus eliminates both screen grid and bias power supplies to make possible the size of this compact amplifier (only 14" tall). For details on Eimac's zero-bias tube and schematic drawing of this 2KW p.e.p. sideband amplifier (covering all amateur bands) write: Amateur Service Dept., Eitel-McCullough, Inc., San Carlos, California.



25 YEARS with PR!



■ Adolph Schwartz, W2CN, is celebrating his 25th year as sales representative for PR Crystals. But W2CN was a ham operator long before that. His original ham license was dated April 12, 1916 . . . Commercial First Class License dated 1917. Before and after World War I, Adolph had call letters 2AFT and 2ASK. He has always been an active amateur, and his present license is Amateur Extra First Grade.

■ Here is W2CN at his rig. Rx-Collins 75A4. Tx-Johnson KW Final. Driver Johnson Pacemaker. Antennas: 40M, inverted vee dipole. 20, 15, 10 M, 3 separate 3 elem. beams. W2CN is active on SSB, AM, and CW, on 40, 20, 15 and 10 meters. He likes to chase DX and has over two hundred confirmations. Give him a call sometime.



■ Top Row: 1916 Ham license; renewal 1917 Commercial License; Bill, W6UF, and W2CN. Lower Row: First Class Commercial License, 1921; 1919 Ham License 2AFT; U.S. Army Discharge; W2CN tied to ball and chain.

■ PR Crystals have been the standard of quality since 1934. It was their outstanding performance and dependability that first interested Adolph Schwartz. In March 1936 he started using PRs in his rig at W2CN. He was so impressed by PR Crystals that he immediately asked to be their sales representative in the New York territory. Says W2CN: "It is a pleasure to sell PR Crystals because they are quality products that operate without trouble to their owners."

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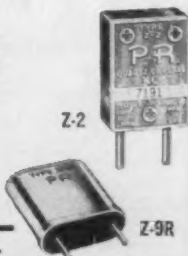
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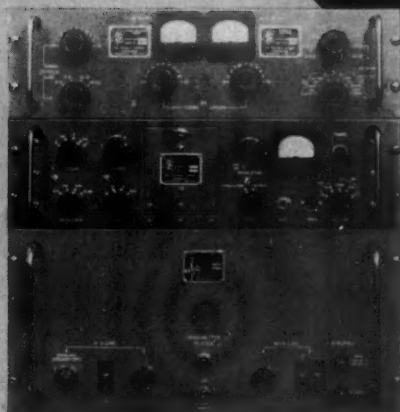
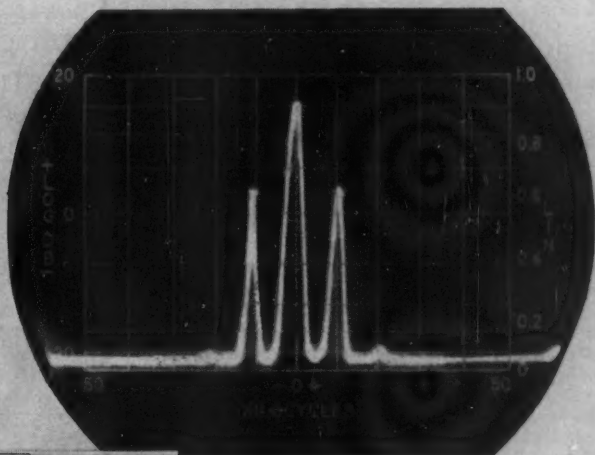


Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in QST. **ARRL Field Organization station appointments** are available in areas shown to qualified League members holding Canadian or FCC amateur license, General or Conditional Class or above. These include QRS, OES, OPS, OO and OBS. SCMs desire applications for SEC, EC, RM and PAM where vacancies exist. OES, v.h.f. bands appointment, is available to Technicians and Novice, as well as to full-privilege amateur licensees.

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

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"It Seems to Us..."



AMATEUR LICENSE FEES

Should we hams be charged a fee by the Government for the issuance of our licenses?

ARRL has always answered this question with a resounding NO, and will continue to do so.

We may be facing this problem again shortly. While no official proposal has yet been made by FCC, Chairman Minow in public appearances has strongly urged the adoption of fees for licensees in all telecommunications services. More recently, the communications trade press has carried speculative stories on the fee matter, including a schedule of charges reported to be "FCC staff recommendations." According to such reports, the fee for amateur, RACES and Disaster Communications Service licensees would be \$5.

We can perhaps take some small comfort, if these reports are at all accurate, in the knowledge that the proposed fee for all other stations in the Safety & Special Radio Services field is \$20, indicating that special consideration has been accorded amateurs, RACES and DCS.

The theory of fees is based on the principle that work performed by Government agencies in the issuance of franchises, licenses, etc., should be self-sustaining insofar as possible. We do not necessarily quarrel with this principle, although we note that the current schedule of fees under consideration for all services, if the reports are correct, would not simply recover the actual costs of licensing, but would recoup the entire amount of the FCC's annual budget! Broadcast stations, for example, would be charged — or perhaps taxed is a more appropriate word — a percentage of their income.

If we accept the principle that each non-Government communications service should stand a reasonable share of its costs to the Government, it is necessary to point out that the amateur radio service already underwrites a substantial share of regulatory costs.

More than two-thirds of all amateur license examinations (Novice, Technician, Conditional) are conducted and supervised by amateurs themselves, not by Commission personnel. This alone is a saving to the Commission of substantial proportions.

The amateur service is largely self-policing.

We have organized our own Official Observer system specifically for this purpose. Thus, for many years the Commission has been able to conduct its supervisory and monitoring responsibilities with considerably fewer personnel than would be required if close attention to the amateur service were an essential.

The Commission has the responsibility for investigation and solution of interference problems between the services under its jurisdiction. Within the amateur bands, we take care of our own mutual interference difficulties. As concerns potential interference to other services, the record of several hundred TVI committees, largely composed of amateur volunteers, speaks for itself. Thus, the amateur service has relieved the Commission of an immense amount of investigative work which would otherwise be necessary for FCC to carry out its responsibilities.

Practically every other radio service has a pecuniary interest. Radiocommunication is used by persons and entities other than amateurs because of the profit motive, whether it be a broadcast station selling advertising time, or a taxi dispatch service increasing efficiency of operation. Even the Citizens service, despite its current widespread illegal use for hobby-type communications, is based on this general theory, whether it is a radio serviceman dispatching his trucks or a farmer in the field calling to his house to arrange the afternoon's work schedule.

At the moment of writing the matter of fees appears dormant, especially with FCC not holding regular meetings during the month of August. Should something like a \$5 fee for amateurs eventually be proposed, however, the League will oppose it as unjust. Charging a fee for the privilege of spending one's time and money solely to acquire skill in the field of electronics is hardly consonant with the U. S. policy of fostering the acquisition of scientific knowledge by more of our citizens. We believe that the voluntary, public-spirited contributions to our national life by the self-trained specialists making up the body of amateur radio are in themselves good and sufficient reasons to exempt the amateur service from payment of a license fee to the Government of the people we serve.

QST

COMING A.R.R.L. CONVENTIONS

September 15-17 — New York State, Niagara Falls.

September 29-30 — Ontario Province, Windsor, Ontario, Canada.

October 7-8 — Midwest Division, Omaha, Nebraska.

October 13-14 — Great Lakes Division, Cleveland, Ohio.

October 13-15 — West Gulf Division, Kerrville, Texas.

October 28 — Kentucky State, Lexington, Kentucky.

MIDWEST DIVISION CONVENTION Omaha, Nebraska — October 7-8

The Midwest Division ARRL Convention will be held in Omaha at the Sheraton-Fontenelle Hotel, beginning at 1 p.m., Saturday, October 7, and concluding at 4 p.m., Sunday, October 8 following the convention banquet. The program includes sessions for s.s.b., RTTY, Novice, traffic, MARS, CD, YL, v.h.f., DX, and a special series of group breakfasts.

Featured convention speakers include Major General Jack Bestie, K4BMR, Director of Telecommunications, U. S. Air Force; John Huntoon, W1LVQ, ARRL General Manager; Brooks Short, W9DPI, Director of Advanced Engineering, Deleo Remy Division, and Bud Drobish, W9QVA, Advanced Engineer, Hallcrafters, along with other notable authorities on various phases of amateur radio.

There is a "fun session" on Saturday night following the Smorgasbord supper with family and group entertainment. Initiation ceremony of the Royal Order of the Wouff Hong is to be held at one minute after midnight Saturday.

Requests for hotel reservations and pre-registration (\$8.50 per person includes both the Smorgasbord and the Sunday banquet) should be addressed to Ak-Sar-Ben Radio Club, Inc., Box 291, Omaha, Nebraska, and postmarked not later than midnight, September 20. Late registration is \$9.50. For additional information write to Royal M. Enders, K0LYO, General Convention Chairman, Box 291, Omaha, Nebraska.

Welcoming transmitters will operate on 75, 10 and 6 meters Friday night and Saturday morning.

NEW YORK STATE CONVENTION September 15-17 — Niagara Falls

The First Annual ARRL New York State Convention will be held at the Hotel Niagara in Niagara Falls on September 15-17, sponsored by the Niagara Radio Club, Inc. The convention committee extends to all an invitation to make the trip to Niagara Falls an event for the entire family. Being one of the largest national tourist attractions it will assure something of interest for every member of the family.

The convention activities begins at noon on Friday, September 15 and ends Sunday, September 17 at 3 p.m. Convention highlights include a Saturday evening banquet honoring A. L. Budlong, Secretary & General Manager Emeritus of ARRL, followed by a dance and at midnight a Royal Order of Wouff Hong Initiation. The An-

tique Wireless Association will present programs and exhibits. DX and s.s.b. sessions, MARS and v.h.f. luncheon, ARRL Forum, tours, equipment and parts exhibits, along with contests, round out a full program.

Featured speakers include Bruce L. Kelley, W2ICE; Travis Marshall, K9EBE; Harold C. Vance, K2FF; Edward S. Liscombe, K4KNV, Assistant Chief of Army MARS; and Dr. Walter Flood of Cornell Aeronautical on radio astronomy. Of added interest to the ladies will be a YLRL program and luncheon with Clara C. Reger, W2RUF, as speaker.

Gary Young, K2AJY, is convention general chairman. Registrations should be sent to Convention Committee, Main Post Office Box 682, Niagara Falls, New York. Pre-registration on will be \$4.50 per person. Banquet tickets are \$4.50 each. Pre-registration ends September 1. Checks and money orders should be made payable to Niagara Radio Club, Inc.

ONTARIO PROVINCE CONVENTION Windsor, Ontario—September 29-30

The Ontario Province Convention is to be held at the Prince Edward Hotel (at the exit to the Detroit-Windsor auto tunnel) in Windsor on September 29-30. A large attendance from Ontario and the adjoining stateside area is expected.

Registration begins at noon, Friday, September 29 with a welcoming reception planned for the afternoon. There will also be a social gathering Friday evening. The ARRL forum will start off the activities Saturday at 10 a.m. Noel Eaton, ARRL Canadian Director will act as chairman. Ed Tilton, W1HDQ of the headquarter's staff, will speak following the forum.

Saturday afternoon events include lectures and discussions on DX, home-brew construction, safety in the shack, auditory devices for sightless hams, test equipment, s.s.b., antennas and RTTY. Displays are planned and a banquet is scheduled for Saturday evening. Entertainment for the ladies is planned.

Initiation ceremonies for the Royal Order of the Wouff Hong are set for Saturday midnight and will conclude convention activities.

Advance registration is \$5.00 for amateurs and \$3.50 for XYLs. Tickets at the door will be \$6.00 and \$4.00. The ticket price includes the banquet and registration. Advance registration may be made by writing to Geoff Baden, VE3EQU, 247 Westminster Street, La Salle, Ontario. Special advance rate expires September 24.

Clean and simple! This compact kilowatt grounded-grid amplifier in its TVI-suppressing cabinet makes an ideal companion for the current crop of space-saving desk-top exciter units. On either side of the plate tank tuning control are the plate/grid milliammeter with its switch (left), and the output indicator with its sensitivity control. Along the lower portion of the panel, from left to right, are controls for input tuning, antenna loading, and the band switch.



High-Power Zero-Bias Grounded-Grid Linear

A 1-Kw. Amplifier Using the New 3-400Z Triode

BY HAROLD C. BARBER,* W6GQK AND ROBERT I. SUTHERLAND,** W6UOV

THE "ideal" linear amplifier package would contain no more than a tube, a filament transformer, a plate supply, and a tuned circuit. It would be simple to build and cost but a few pennies. Unfortunately, such a perfect device does not yet exist, and is not foreseeable in the near future. On the contrary, the customary linear amplifier has come to be an object of astounding complexity, requiring grid-bias supplies, regulated screen supplies, power-dissipating grid resistors and other awesome and complicated devices that add to the cost and weight of the linear but often do nothing to make the signal louder or clearer at the receiver. Indeed, some linear amplifier designs have been almost lost in the maze and complexity of expensive regulated power supplies required to make the beast "tick".

A large quantity of auxiliary equipment can be swept aside and junked if a zero-bias tube is employed in a simple grounded-grid configuration, such as shown in Fig. 1. Various types of transmitting tubes (originally designed for grid-driven service) such as the 813, 811-A, and 4-400A have been used with success as "zero-bias" grounded-grid amplifiers, but no true zero-bias triode of large power capability has been at hand for this class of service. The amplifier described in this article is designed around the new Eimac 3-400Z, a member of a family of zero-bias triode tubes now available to the amateur. Typical operating values are shown in the table on the next page.

The 3-400Z Zero-Bias Tube

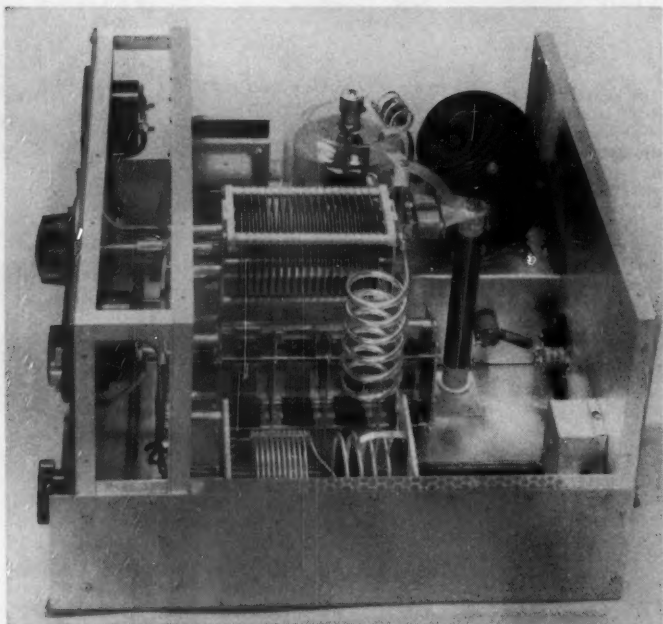
The new 3-400Z tube is a high- μ triode having a plate dissipation of 400 watts. It is rated to 1 kilowatt d.c. input for s.s.b. linear-amplifier service, as shown in the table of typical operating conditions. Within the maximum plate-voltage rating of 3000 volts, the 3-400Z has the very desirable characteristic of having need for neither grid bias nor screen power supply. Old-timers will remember with nostalgia the ancient 46 tube. (Remember the pre-war 160-meter transmitter using a flock of these bottles?) When excitation was removed from the 46, it would simply relax and stop working. The 3-400Z will do this trick too. Used in a grounded grid circuit, no neutralization is required.

The seated height of the 3-400Z is only $4\frac{1}{2}$ inches to the top of the plate radiator cap, making it extremely attractive for the new modern concept of linear-amplifier design. Because of the

The 811-A has long been popular in linear amplifiers because of the simplicity that results when neither screen nor bias supply is required. This feature has been projected in the new higher-power Eimac 3-400Z zero-bias triode around which this compact and clean-looking amplifier is built. The tube is rated at 1-kw. p.e.p. input, and is designed especially for grounded-grid operation without neutralization.

* 280 Justin Drive, San Francisco 12, Calif.

** % Eitel-McCullough, Inc., San Carlos, Calif.



End view of the amplifier chassis. The plate tuning capacitor is supported from the sub-panel on three 1 $\frac{3}{4}$ -inch metal pillars. It is centered 3 inches below the top of the panel. Below the plate capacitor and on the same center line is the loading capacitor with sections connected in parallel with copper strap. On the rear of this capacitor is mounted a small aluminum angle plate which supports the plate-circuit r.f. choke. On one rear stator terminal of the plate tuning capacitor is placed a bracket which supports the two plate-blocking capacitors C_5 and C_6 . On the opposite stator terminal is a small bracket holding a $\frac{1}{2}$ -inch ceramic insulator. This supports the plate strap and one end of the parasitic suppressor. A third bracket connects the top terminal of the r.f. choke to the blocking capacitors. The small aluminum box at lower right contains the diode and associated circuitry of the r.f. output voltmeter. The two plate bypass capacitors C_7 and C_8 may be seen to the right of the plate choke, with the v.h.f. choke tied between. The plate tank-coil assembly is in the foreground.

small tube size, and because no one has yet been able to miniaturize a watt, it is necessary to cool the tube seals, envelope, and plate lead with an auxiliary blower.

Elimination of the bias and screen supplies allows a large saving in cash normally spent for these items, and also saves the builder the labor (and skinned knuckles) required to drill the holes, mount the parts, and do the necessary wiring on these electronic nuisances. A large bonus in the form of simplicity and low cost accrues to the user of a zero-bias tube!

The Amplifier Circuit

The 3-400Z grounded-grid amplifier shown in the photographs is designed for an input of 1 kilowatt p.e.p. sideband, or 1 kilowatt c.w. operation. In addition, it may be run as an a.m. linear amplifier at an input level of 600 watts (carrier output about 200 watts). Band-switching circuits are ganged, and cover the amateur bands from 3.5 to 29.7 Mc. with generous overlaps. A pi-network output circuit is used. The order of tank capacitance is large to enhance a high degree of linearity. Since it is necessary to moni-

Eimac 3-400Z Triode

General Characteristics

Filament: 5.0 volts at 14.5 amperes

Interelectrode capacitances:

Grid-filament: 7.4 μ f.

Grid-plate: 4.1 μ f.

Plate-filament: 0.07 μ f.

Typical Operation

2500 volts plate potential, grounded-grid circuitry

Zero-signal plate current: 75 ma.*

Single-tone d.c. plate current: 400 ma.

Single-tone d.c. grid current: 140 ma.

Two-tone d.c. plate current: 275 ma.

Two-tone d.c. grid current: 82 ma.

P.e.p. input: 1000 watts

P.e.p. output: 560 watts**

Resonant load impedance: 3450 ohms

Intermodulation products: -35 db, or more below p.e.p. signal level

Driving power (approx.): 32 watts, p.e.p.

* Approximate value.

** Includes circuit losses.

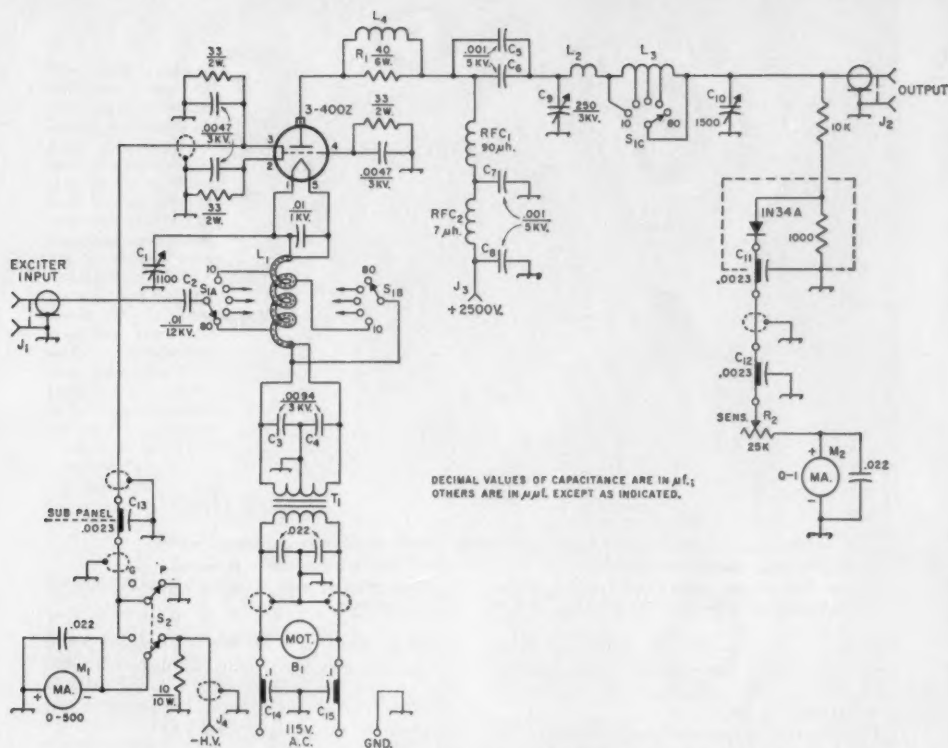


Fig. 1—Circuit of the high-power grounded-grid linear. Capacitors not listed below are disk ceramic. Resistances are in ohms and resistors are 1/2 watt unless indicated otherwise.

B₁—15-cu. ft./min. blower (Fasco Industries® No. 50745-IN).
C₁—3-section broadcast-replacement variable, 365 μf. per section, sections in parallel (Miller 2113).

C₂—Transmitting mica.

C₃, C₄—Two 0.0047-μf. 3000-volt disk ceramic units in parallel.

C₅, C₆, C₇, C₈—Doorknob-type ceramic (Centralab 8585-1000).

C₉—Transmitting variable, 0.075-inch plate spacing (Johnson 250E30/154-9).

C₁₀—4-section broadcast-replacement variable, 365 μf. per section, sections in parallel (Miller 2104).

C₁₁, C₁₂, C₁₃—Feed-through type capacitor (Centralab FT-2300).

C₁₄, C₁₅—600-volt 20-ampere feed-through capacitor (Sprague 80P3).

J₁, J₂—Chassis-mounting coaxial receptacle (SO-239 or UG-58A/U).

J₃, J₄—High-voltage connector (Millen 37001).

L₁—Coaxial winding—see text.

L₂—6 turns 3/16-inch copper tubing, 1 3/8-inch I.D., length 4 inches.

L₃—Approx. 10 μh., tapped at 5 μh., 2.5 μh., and 1.5 μh. (part of modified B & W model 851 coil assembly—see text).

L₄—4 turns No. 12, 3/4-inch diam., 1 inch long.

M₁—2-inch d.c. milliammeter, 0–500-ma. scale.

M₂—2-inch d.c. milliammeter, 0–1-ma. scale.

R₁—Three 120-ohm 2-watt composition resistors in parallel.

R₂—Linear-taper control.

RFC₁—90-μh. 500-ma. r.f. choke—175 turns No. 26, 4 3/8 inches long on 3/4-inch ceramic form (B & W 800).

RFC₂—V.h.f. choke (Ohmite Z-50).

S_{1A-B}—1-section 2-pole 5-position ceramic rotary switch, 30-degree indexing (Centralab P-122 index assembly with one type RR wafer).

S_{1C}—Single-pole 5-position rotary switch (part of L₃ assembly).

S₂—1-section 2-pole 2-position ceramic rotary switch (Centralab PA-1003).

T₁—Filament transformer: 5 volts, 13 amperes (Triad F9A).

* Davis and Toppin Sts., Rochester 2, N. Y.

for the output level of any linear stage, a simple semiconductor voltmeter is incorporated in the output portion of the network. The voltmeter range is variable, since absolute readings are not necessary.

Proper operation of the amplifier may be established by maintaining a given ratio between grid and plate currents. The grounded grid,

therefore, is "ungrounded" sufficiently to permit insertion of a simple metering circuit. If this is done properly, the stability and operation of the amplifier will remain unchanged. To achieve this, each of the three grid pins of the 3-400Z socket is grounded by a low-impedance resistor-capacitor combination. The resistors are shunted across the milliammeter, but have a value sufficiently

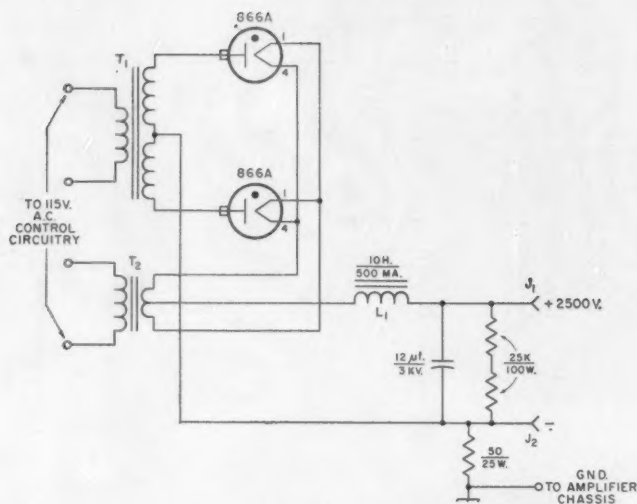


Fig. 2—Circuit of the power supply used with the 3-400Z amplifier. Resistances are in ohms.

J_1, J_2 —High-voltage connector (Millen 37001).

L_1 —10-hy. 500-ma. filter choke (Triad C-22A or similar).

T_1 —Plate transformer: 2900-0-2900 volts r.m.s., 375 ma.

d.c. (Stancor P-8034 or similar).

T_2 —Filament transformer: 2.5 volts, 10 amps., 10,000-volt insulation.

high so as not to disturb the calibration of the meter to any great degree. High-voltage capacitor units are used here to obtain the required r.f. current-carrying ability.

Plate current is measured in the negative lead of the power supply, rather than in the filament return circuit, since the latter carries a combination of grid and plate currents. The negative side of the power supply is above ground by the voltage drop across a 50-ohm resistor, so it is necessary to "float" the power supply above chassis potential as shown in Fig. 2. The 10-ohm 10-watt resistor at J_4 is included to provide a connection to the chassis should a conventional power supply (negative grounded to chassis) be used with its negative terminal connected to J_4 . In such a case, there would otherwise be no negative high-voltage connection to the amplifier with the meter switched to read grid current. On the other hand, connecting a conventional supply to the amplifier ground terminal would short out the meter in the plate-current position.

The driving impedance of the 3-400Z is a nominal 122 ohms. Since this figure varies widely over the operating cycle, a high- C tuned cathode circuit, C_1L_1 , is employed to stabilize the load impedance as seen by the exciter. Filament voltage is applied to the tube via the coil of this circuit which is in the form of a coaxial winding having two sets of taps. One set of taps (S_{1B}) is for establishing resonance in the various bands. Excitation is fed to the second set (S_{1A}). The latter is set for minimum standing-wave ratio on the coaxial line from the exciter (50 ohms in this case). The usual driving difficulties experienced with grounded-grid amplifiers are entirely absent, and no coupling problems have been found in

switching from band to band. Increased power output, reduced intermodulation distortion, and ease of drive are gained when a tuned cathode circuit is used in preference to the old-fashioned untuned r.f. choke input circuit.¹

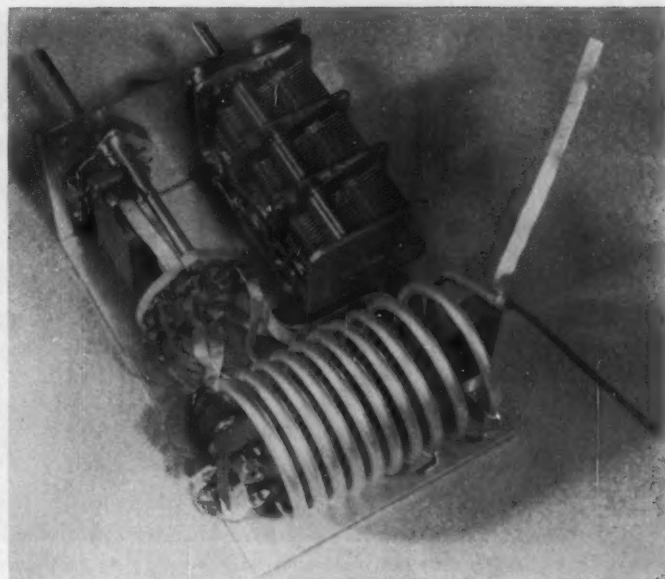
Construction of the Tuned Cathode Circuit

The tuned cathode circuit is built as a discrete subassembly. The unit consists of the coaxial coil L_1 , the tuning capacitor C_1 , the coupling capacitor C_2 , bypass capacitors C_3 and C_4 , and band switch sections S_{1A} and S_{1B} . The coaxial coil is wound from a 61-inch length of standard 3/16-inch soft copper tubing, available at auto-parts houses, refrigerator-repair departments, and large hardware stores. Before the coil is wound, a length of No. 12 Formvar-insulated copper wire is passed through the tubing, leaving about three inches protruding from each end. Be sure you sand the ends of the tubing to a smooth, rounded edge to prevent marring or scraping the insulation of the wire during this operation. Wire with enamel insulation should not be used, since enamel is too soft and may be easily damaged. Next, the coil is wound around a 1½-inch form (a section of water pipe may be used), making a coil of approximately 10½ turns.

The copper-tubing coil has two taps for each band. The shorting tap (S_{1B}) selects the proper tuning inductance for the band in use, while the other tap (S_{1A}), placed slightly higher on the coil, is for coupling to the driver, as explained earlier. Counting from the top end of the coil (filament end), the 10-meter band tap is at 1½ turns with the excitation tap at 1 turn; the 15-

¹ Orr, Rinaudo and Sutherland, "The Grounded-Grid Linear Amplifier," *QST*, August, 1961, p. 16.

The high-C cathode tank circuit is made up as a separate subassembly. Band-switching leads are of copper strap. Enamelled wire is used for the excitation taps. The two terminals at the left-hand end of the coil-supporting strip are for filament input connections. Output connections to the tube socket are the loose strap and inner conductor to the right. This strap also makes the connection to the stator of the tuning capacitor. The fixed capacitor above the switch is the input coupling capacitor C_2 .



meter tap is at $2\frac{1}{2}$ turns and the excitation tap at $1\frac{1}{2}$ turns; on 20 meters, the band tap is at $3\frac{1}{2}$ turns and the excitation tap at $1\frac{1}{2}$ turns (same as for 15 meters). On 40, the band tap is at $6\frac{1}{2}$ turns, and the excitation tap at 3 turns. On 80 meters, the full coil is used with the excitation tap at $4\frac{1}{2}$ turns.

Soft copper strap $\frac{1}{4}$ inch wide is used for the band-switch leads and the 50-ohm driving points are tapped with No. 18 enameled wire. All taps are soldered to the copper tubing.

The completed coil is mounted on a piece of $\frac{1}{4}$ -inch bakelite or phenolic sheet measuring 4 by $1\frac{3}{8}$ inches. The turns at the high-frequency (filament) end are spread as shown in the photo. The sheet is drilled and tapped to mount vertically on small ceramic standoff insulators bolted to the subassembly chassis. The chassis measures 6 by 4 inches, with a $2\frac{3}{8}$ -inch lip on the front end.

When mounting the band switch, keep in mind that the plate inductor and the cathode inductor will be switched simultaneously by means of a chain and sprocket drive. Therefore, the cathode-coil switch must have the 80-meter setting fall in the full clockwise position corresponding to the tap sequence of the B & W coil unit used in the output circuit.

The capacitor C_2 , in series with the exciter input, carries the full excitation current and must be a transmitting-type mica unit. Filament capacitors C_3 and C_4 are paralleled ceramic units chosen to conserve space and yet provide sufficient capacitance to insure that the secondary of transformer T_1 is at r.f. ground potential. These capacitors are mounted directly at the "cold" terminals of the coaxial filament coil. The plate-cathode r.f. return circuit is via the cathode tuned circuit. The lead from the stator

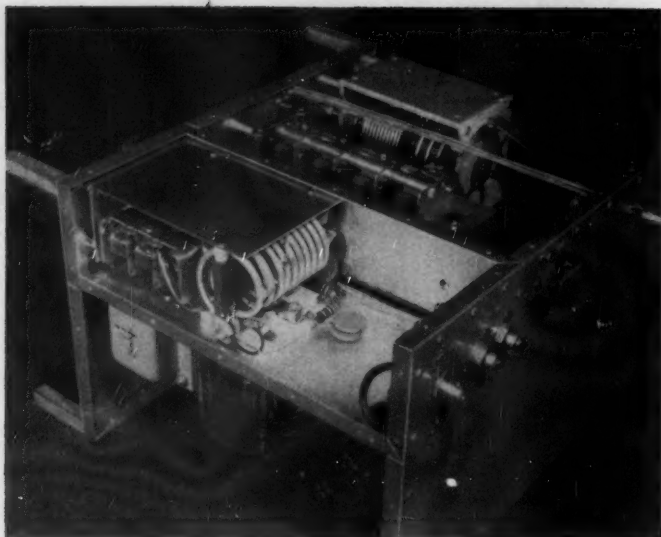
terminals of C_1 to the filament circuit and the coaxial coil is made of $\frac{1}{4}$ -inch copper strap.

The series input capacitor C_2 is wired directly to the arm of the band switch with copper strap. The center conductor of the coaxial line from the exciter input receptacle is soldered to the coupling-capacitor terminal and the shield is grounded directly to the frame of C_1 . The impedance of this tuned circuit is extremely low, and care must be taken in the design and assembly to make sure that the impedance is in the tuned circuit, and not in the various interconnecting leads and switches.

Shielding Enclosure

This little powerhouse measures only $8\frac{3}{4}$ inches high, 14 inches wide, and 15 inches deep — small enough to sit on the desk beside your sideband exciter or receiver. Construction is unique in that no chassis is used; the cabinet serves as the chassis. The TVI-suppressing enclosure is fabricated from 0.063-inch aluminum sheet and $\frac{1}{2}$ -inch aluminum angle stock. The front panel is cut from $\frac{1}{8}$ -inch dural and measures $8\frac{3}{4}$ inches high by 14 inches wide. The subpanel and rear panel are of the thinner aluminum cut to the same dimensions. All three pieces are framed with the corner stock as shown in the illustrations. Spacing between the panel and the subpanel is $2\frac{1}{2}$ inches, the two being joined by four corner posts made of $\frac{1}{2}$ -inch-square aluminum stock.

The bottom of the enclosure is formed in the shape of a U, wrapping around the bottom and part way up the sides of the unit. This piece measures 14 inches wide and 15 inches deep. The sides turn up $3\frac{3}{8}$ inches. The forward edge extends $\frac{1}{2}$ inch in front of the main panel.



Bottom view of the 3-400Z grounded-grid amplifier, showing the mounting of the filament transformer, tube and blower on the L-shaped chassis. The cathode-tank subassembly above is mounted on the subpanel with spacers. The tube socket is oriented with the filament terminals toward the outer edge of the chassis to permit short connections to the near end of the coaxial coil. One of the three resistor-capacitor grid terminations can be seen at the right-hand side of the socket. (The two units in parallel are each half of the required capacitance and were used because they were on hand.) Along the rear are the r.f. input connector, the feed-through capacitors used as a.c.-input terminals, positive high-voltage connector, ground stud, negative high-voltage terminal (separate from ground) and the r.f. output connector. The output pi-network coil assembly and output capacitor are in the background.

The top edges of the sides are backed up by strips of aluminum which serve as a means for fastening down the top cover and sealing the seam between the upper and lower cabinet sections.

The top cover is also U-shaped, and is made of perforated aluminum to allow the exhaust air to escape from the main compartment. The cover measures 14 inches wide, 15 inches deep, and $5\frac{1}{4}$ inches high. The top and bottom pieces are attached to the frame by means of sheet-metal screws.

The input circuit of the amplifier is contained within an L-shaped box, as shown in the under-chassis photograph. The compartment is approximately 12 inches deep (this depth is determined by the finished dimension between the subpanel and the rear panel) and $3\frac{3}{4}$ inches high. It has two $\frac{1}{2}$ -inch lips, one along the side and the other along the bottom. Together with the bottom cover and the panels, it makes an r.f.-tight and airtight compartment for the cathode input circuit and blower, respectively.

The plate-circuit components require no chassis. The two pi-network capacitors are mounted to the subpanel by means of 6-32 screws and spacers. The plate-coil assembly is affixed in a similar fashion as shown in the bottom view.

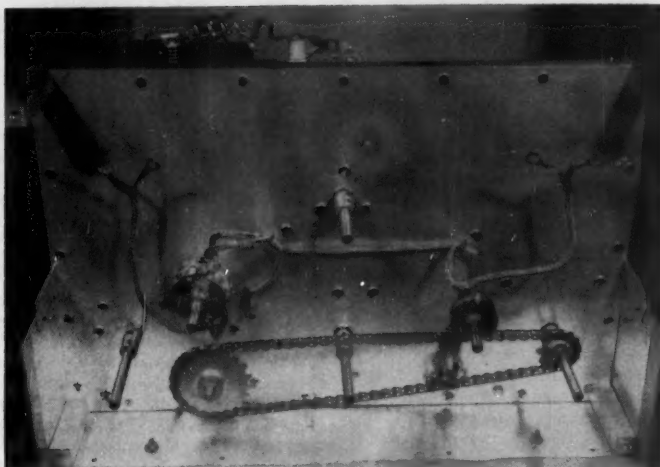
Component Layout and Assembly

General component placement may be seen from the photographs. The panel meters are isolated from the r.f. circuits by virtue of the

subpanel. The plate band switch and the cathode-circuit switch are ganged for ease of operation. In the meter area is also located the chain drive for the cathode band switch, as shown in detail in one of the photos. A 2-to-1 reduction drive ratio is needed, since the plate-inductor unit has 60-degree indexing, while the cathode switch has 30-degree indexing.

The filament transformer is placed at the front of the cathode-circuit box. Although slightly under-rated for the job, this unit has operated for hours with no evidence of overheating. The tube socket and chimney are centered on the box, $5\frac{1}{2}$ inches behind the subpanel, and the remaining space is occupied by the centrifugal blower and motor. A Johnson ceramic socket was used for the tube, but the new Eimac SK-410 air socket and SK-416 chimney are recommended as an inexpensive substitute.

The band-switching plate-inductor assembly is at the opposite side of the main compartment. The unit is rated at 500 watts input. However, it was disassembled, silver-plated, and modified for one kilowatt *sideband* and *c.w.* operation. A new 10-meter section was wound, and the taps were altered to provide the proper *L/C* ratio for optimum amplifier linearity. First, turns are removed from the small-wire end of the coil until a total of $11\frac{1}{2}$ turns remain in this section of the coil. The 40-meter tap is placed at $7\frac{1}{2}$ turns from the antenna end of this section, and the 20-meter tap at the junction of the two coil sec-



Removing the front panel reveals the chain-sprocket system which gangs the input and output band switches. Sprockets and chain are made by Perfection Gear Co. (American Stock Gear Division, 152nd St. and Vincennes Ave., Harvey, Ill.) The small sprocket to the right (plate switch) is 1.125 inches in diameter, has 10 teeth and is designated as No. C-10. The larger one (cathode switch) is 2.030 inches in diameter, has 20 teeth and is designated as No. C-20. The chain designation is No. 18/42. About 2 feet are required. Dangling on their leads are the meter switch (left) and the output-indicator sensitivity control. This view also shows the four square corner posts which space the panel from the subpanel.

tions. The 15-meter tap is on the large-wire section, $1\frac{3}{4}$ turns from the 20-meter tap, leaving $2\frac{3}{4}$ turns at this end of the coil. A new coil was wound to replace the original 10-meter section. This consists of 6 turns of 3/16-inch copper tubing, $1\frac{3}{8}$ -inch inside diameter, with a coil length of 4 inches. The new coil was mounted as shown in the side-view photo.

Amplifier Wiring

Shielded wire is employed for all low-voltage circuits and small feed-through capacitors pass the leads from the amplifier compartment into the meter compartment. Coaxial capacitors are employed as 115-volt a.c. terminals on the rear apron of the chassis. Silver-plated, $\frac{1}{2}$ -inch copper strap is used for the output wiring of the pi-network circuit. The four stator sections of the output capacitor of the network are paralleled by a short length of strap. All wiring is short and direct.

Testing the Amplifier

The amplifier is entirely free from unwanted regeneration or parasitics, and operation is simple and straightforward. It is designed to operate with a 2500-volt, 400-ma. power supply of good regulation. Fig. 2 shows the circuit of the power supply used with the amplifier.

Preliminary adjustments should be made at reduced plate voltage and with a minimum value of excitation. Excitation should never be applied without plate voltage. Once resonance is established, the tube should be loaded up to a plate current of approximately 400 ma. The grid current at this particular operating point should be about 140 ma. The ratio of about 3 plate milli-

amperes to 1 grid milliamperes should be maintained for all operating conditions. If the grid current is excessive, it indicates that the plate-circuit loading is too light. Low grid current indicates that plate loading is too heavy. As a final check, it should be observed that the output of the stage (as observed on the output voltmeter) should increase in direct proportion to the excitation level. Finally, to achieve a condition of maximum linearity, the plate output circuit should be *overcoupled* (by decreasing the value of the pi-network output capacitor) until power output drops about 3 per cent. With a two-tone test signal, the maximum-signal plate current read on the meter should be 275 ma., and the grid current about 80 ma. With an average voice, plate current as read on the meter should kick up to about 180 or 200 milliamperes, with grid current peaks of about 60 to 70 milliamperes. P.e.p. input under these conditions will be one kilowatt, and all spurious distortion products will be reduced better than -35 db. below peak-signal level. Under proper operating conditions, signal-to-distortion ratios better than -42 db. with a two-tone test signal have been achieved with this tube in this circuit. Distortion ratios of this order can be obtained with conventional amateur tubes only by employing feedback circuits.

The cost of all parts, including the tube, air socket, and chimney, is under two hundred dollars. Amateurs owning a good junk box, or who are "surplus hounds," can cut this cost figure considerably. Considered both on a watts-per-dollar basis, and on a linearity basis, this little powerhouse is hard to beat for maximum performance!

QST

Handling OSCAR Reports by Radiogram

BY J. A. GMELIN,* W6ZRJ

OSCAR will give amateurs everywhere a chance to test their skills at tracking a satellite of our own design operating in our own bands and report observations of its radio beacon to a central amateur tracking group. Methods of tracking the OSCAR signal and reporting by mail were well explained in July 1961 *QST*¹ by Walters, Wells and Hillesland.¹ It is hoped by the OSCAR Association that all amateurs who track OSCAR will send in such detailed reports, but since immediate reports of the signal will also be of great value, especially in the first few hours of orbit, it is expected that many amateurs will send reports to the tracking team by radiograms via the existing amateur traffic organizations.

It is also expected, since amateurs represent a cross-section of radio skills ranging from engineers and scientists with a high degree of interest to amateurs whose occupations are far removed from the radio and electronics field, that there will be a wide range of tracking capability in the field. Not all amateurs will be able to obtain all of the information as outlined in previous articles; rather, some will perhaps only be able to listen to the signal and report the time of first hearing and the time it fades out. Some will perhaps be able to give accurate signal strength readings while others will only make a guess.

But all of this information is of value to the

* 1089 Huntington Drive, San Jose, Calif.

¹ Walters, Wells and Hillesland, "Project OSCAR Measurement and Tracking," July 1961 *QST*, p. 59.

OSCAR group, especially if it is received within a short period of the actual observations. Thus, radiograms containing both short and medium length reports are expected. Such messages will also be of service to the traffic men, giving them opportunity to handle messages of value and testing their facilities.

What Message Form to Use?

It is hoped that all amateurs reporting on OSCAR tracking by radiogram will use the same standard message form. This will make it easier for the OSCAR communications team to funnel the radio reports into the tracking headquarters in Sunnyvale, Calif. The OSCAR communications team has selected the ARRL standard message form since this project is now affiliated with the League and this form is standard throughout most of the amateur traffic organization. It is recommended that all OSCAR report radiograms be sent on this form which can be found in *Operating an Amateur Radio Station*² or the *ARRL Handbook*.

For those amateurs who do mostly v.h.f. experimenting and have little contact with handling of messages, making contact with one of the local traffic gang would be of value, as he can explain not only the message form but also how to file a message into a net. Or perhaps he will handle your OSCAR traffic for you.

² *Operating an Amateur Radio Station*, Thirty-ninth Edition, The American Radio Relay League, West Hartford, Conn. Free to League members; price to others, 25 cents.

Fig. 1—Short Form

<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p>THE AMERICAN RADIO RELAY LEAGUE</p> <h2 style="margin: 0;">RADIOGRAM</h2> <p style="font-size: small;">VIA AMATEUR RADIO</p> </div> </div>														
NUMBER	I W6ZRJ	CHECK	SAN JOSE OF CF	2320Z	JULY 9									
<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>To</p> <p>OSCAR</p> <p>SUNNYVALE CF</p> <p> 37N/127W/2118Z/2146Z/19DB</p> <p>W6ZRJ</p> </div> <div style="width: 35%; border: 1px solid black; padding: 5px; font-size: x-small;"> <p style="text-align: center;">THIS RADIO MESSAGE WAS RECEIVED AT</p> <p>AMATEUR STATION _____ PHONE _____</p> <p>OWNER _____</p> <p>STREET ADDRESS _____</p> <p>CITY AND STATE _____</p> </div> </div>														
<p style="font-size: x-small;">SENDER'S ADDRESS AND PHONE NUMBER FOR REFERENCE</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; border-bottom: 1px solid black;">FROM STATION</td> <td style="width: 33%; border-bottom: 1px solid black;">LOCATED AT</td> <td style="width: 33%; border-bottom: 1px solid black;">DATE</td> </tr> <tr> <td style="border-bottom: 1px solid black;">SENT</td> <td style="border-bottom: 1px solid black;">TO STATION</td> <td style="border-bottom: 1px solid black;">TIME</td> </tr> <tr> <td style="border-bottom: 1px solid black;"></td> <td style="border-bottom: 1px solid black;"></td> <td style="border-bottom: 1px solid black;">OPERATOR</td> </tr> </table>						FROM STATION	LOCATED AT	DATE	SENT	TO STATION	TIME			OPERATOR
FROM STATION	LOCATED AT	DATE												
SENT	TO STATION	TIME												
		OPERATOR												

YOUR REPLY TO THIS MESSAGE WILL BE HANDLED WITHOUT CHARGE BY THE RECEIVING STATION WHOSE ADDRESS IS SHOWN ABOVE. AMATEUR RADIO OPERATIONS AND MEMBERS OF THE A.R.R.L. LICENSED BY THE FEDERAL COMMUNICATIONS COMMISSION, OFFER TO THE PUBLIC A MESSAGE SERVICE WITHIN THE U.S.A. AND ITS POSSESSIONS WHERE POSSIBLE. AS MESSAGES ARE HANDLED BY RADIO AMATEURS SOLELY FOR THE PLEASURE OF OPERATING, NO COMPENSATION CAN BE ACCEPTED BY A STATION OWNER. NO DELIVERY IS NOT GUARANTEED BY THE LEAGUE OR ITS MEMBER OPERATORS. AMATEURS ARE REQUESTED FOR THEIR WORK IN PUBLIC EMERGENCIES. FURTHER INFORMATION ON THIS INTERESTING HOBBY MAY BE OBTAINED DIRECTLY FROM A.R.R.L. HEADQUARTERS, WEST HARTFORD, CONN. LIT-100 U.S.A.

What About the Text?

In order to keep the texts of messages as short as possible, two different abbreviated text forms have been designed by the OSCAR communications group as standards for reports. These plus the complete written report form are the three general methods for sending in tracking data.

The first text is the simplest report sent via amateur radiogram and includes your location, the time the signal of OSCAR was first heard, the time the signal faded out, and the signal strength at maximum. These may be sent in the standard text as a one-word check message. This is done by running all items together with slant bar separation. Fig. 1 is an example of this type of message report.

Note that the latitude comes first, followed by the longitude, then the two times (which must be in GMT to be of value) followed by the signal strength. Each item is separated with a slant bar. What if you have to leave something out? Omissions could cause trouble, because it might be difficult to know what was left out. To correct this, if you must leave out one or more elements, fill their place with X's. Use an X for each number or letter you are leaving out. This will let the trackers know which element(s) are left out and the remaining information will be of value. The signature of the message should be the call of the tracking station.

The second message form is longer and will allow for several separate observations on the same pass. A sample of this message form is shown in Fig. 2. Note that again the slant bar is used but that each separate tracking observation is abbreviated and combined and that tracking observations are then set off with STOP or

PERIOD spelled out. Thus any number of observations taken during any one pass can be included in this form of text. The latitude and longitude are sent together at the beginning of the text and then are set off from each observation with STOP or PERIOD. Again the times must be in GMT and any omissions will be filled in with Xs.

Each separate tracking observation should include the following: Time (in GMT), beam heading in azimuth and elevation in degrees, signal strength in db. above noise level, seconds per 10 "HIs", and c.p.s. plus or minus 145,000 (for Doppler shift). Any remarks may be included at the end of the message as plain text.

In counting the text for check, remember to count anything run together with slant bars as one each. The signature is not part of the check. As in the first text form, the signature should be the call of the station which tracked the OSCAR signal.

Extreme care should be used by amateurs handling OSCAR messages to insure as high an accuracy as possible, since garbled numbers will disrupt tracking analysis results.

Where to Send Message Reports

All radiograms should be sent to OSCAR, Sunnyvale Calif. In the actual messages, California can be abbreviated as just CF, a standard abbreviation on most nets today. It is hoped by the OSCAR tracking group that detailed reports will also be sent by mail after radiogram reports have been sent, if there is further information that will be of value. Written reports should be sent to OSCAR, P. O. Box 183, Sunnyvale, Calif.

(Continued on page 140)

Fig. 2—Long Form

THE AMERICAN RADIO RELAY LEAGUE RADIOGRAM <small>VIA AMATEUR RADIO</small>														
ROUTE 2	W6VZT	10°	LOS GATOS	CF	0515Z JULY 9									
To OSCAR SUNNYVALE CF				<small>THIS RADIO MESSAGE WAS RECEIVED AT</small> AMATEUR STATION _____ PHONE _____ OWNER _____ STREET ADDRESS _____ CITY AND STATE _____										
37N/127W STOP 0355Z/175/22/20DB/13/MINUS 214 STOP 0400Z/180/25/15DB/XX/PLUS 235 STOP LOST CONTACT AT 0403Z														
W6VZT														
<small>SENDER'S ADDRESS AND PHONE NUMBER FOR REFERENCE</small> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%; border-bottom: 1px solid black;">FROM STATION</td> <td style="width: 33%; border-bottom: 1px solid black;">LOCATED AT</td> <td style="width: 33%; border-bottom: 1px solid black;">DATE</td> </tr> <tr> <td style="width: 33%; border-bottom: 1px solid black;">TO STATION</td> <td style="width: 33%; border-bottom: 1px solid black;"></td> <td style="width: 33%; border-bottom: 1px solid black;">TIME</td> </tr> <tr> <td style="width: 33%; border-bottom: 1px solid black;">OPERATOR</td> <td style="width: 33%; border-bottom: 1px solid black;"></td> <td style="width: 33%; border-bottom: 1px solid black;"></td> </tr> </table>						FROM STATION	LOCATED AT	DATE	TO STATION		TIME	OPERATOR		
FROM STATION	LOCATED AT	DATE												
TO STATION		TIME												
OPERATOR														

YOUR REPLY TO THIS MESSAGE WILL BE HANDLED WITHOUT CHARGE BY THE RECEIVING STATION WHOSE ADDRESS IS SHOWN ABOVE. AMATEUR RADIO OPERATORS AND MEMBERS OF THE A.R.R.L. LICENSED BY THE FEDERAL COMMUNICATIONS COMMISSION, OFFER TO THE PUBLIC A MESSAGE SERVICE WITHIN THE U.S.A. AND ITS POSSESSIONS WHERE POSSIBLE. AS MESSAGES ARE HANDLED BY RADIO AMATEURS SOLELY FOR THE PLEASURE OF OPERATING, NO COMPENSATION CAN BE ACCEPTED BY A STATION OWNER. SO DELIVERY IS NOT GUARANTEED BY THE LEAGUE. ON ITS MEMBER OPERATORS. AMATEURS ARE ADVISED THAT THEIR WORK IN PUBLIC EMERGENCIES, FURTHER INFORMATION ON THIS INTERESTING HOBBY MAY BE OBTAINED DIRECTLY FROM A.R.R.L. HEADQUARTERS, 1430 WEST HARTFORD, CONNE. 06108, U.S.A.



A group of typical subassemblies. Here, from left to right are a 144-Mc. transmitter, a transmitter covering 80 and 40 meters, a tunable converter covering the same two bands, and the external a.c. power supply.

Fixed or Portable for 2 Through 160

A Versatile Rig Using

Plug-In Subassemblies

BY EDWARD B. NOEL,* W8GRY

THE popularity of small portable receiver-transmitter combinations is evident from the number of excellent commercial units on the market. The fun that some of my friends have with their Gonset Communicators inspired the versatile rig shown in the photographs. Although somewhat greater in size, it handles more power, and provision is made for operation on any band desired from 2 to 160 meters.

This assembly is designed on the plug-in unit plan. A separate transmitter unit is used for each band. The unit for the desired band fits into the upper right-hand corner of the cabinet which is in the form of an approximate 12-inch cube made of sheet aluminum. A modulator and control unit of the same dimensions as the transmitter units slides into the upper left-hand corner of the enclosure.

The receiving equipment, which occupies the lower half of the carrying case, consists of a converter, either crystal-controlled or tunable, for the desired band working to a Command receiver used as an i.f. amplifier. An R-25/BC-454 (3-6 Mc.) is used with the 50- and 144-Mc. converters, while an R-26 (1.5-3 Mc.) is used with the converters for the lower frequencies. With crystal-controlled converters, the Command receiver serves as a tunable i.f. amplifier.

This arrangement provides almost unlimited flexibility and should appeal to many since it is

* 1361 Oakridge Drive, Cleveland Heights 21, Ohio.

A 30-watt portable phone c.w. station in one cubic foot of space. The design is based on the principle of plug-in subassemblies providing operation in any chosen band from 2 to 160 meters.

necessary to build equipment for only those bands in which the operator is interested. The various units will not be described in detail because, for the most part, they follow standard designs found in the *ARRL Handbook* or *QST* articles. Also, some builders will want to incorporate their own individual ideas. However, some of the more significant points will be discussed as a guide.

Transmitters

My units for 80, 40 and 10 can be operated with either v.f.o. or crystal control. The 6- and 2-meter units are crystal only. All units use a 2E26 in the final. With the modulator and power supply described later, the final may be operated at 28 watts input on phone or 35 watts input on c.w. For a 15-watt input level, a 5763 operating at 300 volts could be used in the final.

A portable transmitter is often called upon to work into a wide range of impedances, and it is well to keep this in mind in designing the transmitters. Most of my transmitters are designed to work into a low-impedance line, either by means of a low-impedance link with series-tuning capacitor or a pi network. An outboard L network may be used to transform higher-impedance loads to match the low-impedance output.

Fig. 1 shows the screen-grid keying circuit used.¹ This circuit performs well even on v.h.f. As with any screen-grid keying circuit, it is de-

¹ Williams, "No Clicks—No Backwave," *CQ*, Feb., 1953.

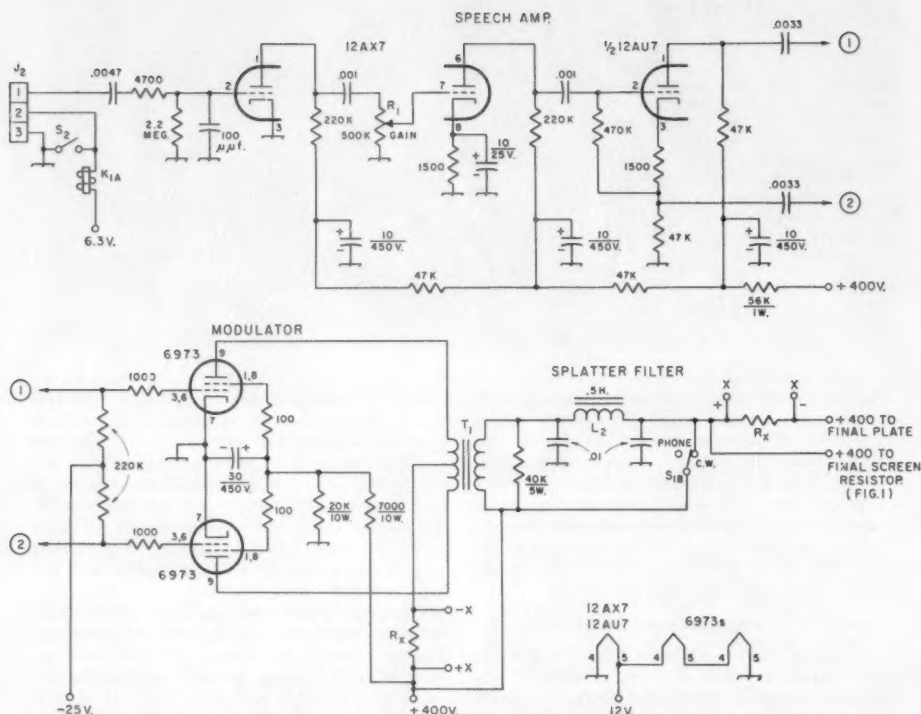


Fig. 2—Speech-amplifier and modulator circuits. Capacitances are in μf , and resistors are $\frac{1}{2}$ watt unless indicated otherwise. Resistances are in ohms. Capacitors marked with polarity are electrolytic. Splatter-filter capacitors (0.01 μf .) should have a voltage rating of 1000 or more. Terminals marked X go to a meter switch; R_X is a shunt appropriate for the desired full-scale meter reading.

J₂—Double-circuit microphone connector.

K₁—6-volt 3-pole double-throw relay (see Fig. 4 for contact connections).

L₂—Splatter choke (Triad C-26X or similar).

R₁—Audio-taper control.

S_{1B}—See Fig. 1.

S₂—S.p.s.t. toggle switch.

T₁—25-watt modulation transformer: 8000 ohms plate to plate, to 6000 ohms (UTC 5-19 or similar).

and the splatter filter for the modulator, although this is not actually included in the modulator unit because of space limitations.

Assembly Details

The cabinet measures $12\frac{1}{4}$ by $12\frac{1}{4}$ by 12 inches deep, and is made of four pieces of $\frac{1}{8}$ -inch aluminum sheet. The door at the rear and the divider shelf are of $\frac{1}{16}$ -inch stock. The modulator and transmitter units are built on standard $5 \times 9\frac{1}{2} \times 2$ -inch chassis, and $5 \times 7 \times 2$ -inch chassis are used for most of the converters. Each unit has a panel measuring $5\frac{1}{4} \times 6$ inches square. Holes in the lower corners slide over 6-32 screws attached to brackets mounted inside the cabinet, and the units are held in place with knurled thumb nuts.

A three-unit Command receiver rack was cut up and installed in the lower right-hand section of the cabinet so that the Command receivers slide in and out easily. Space for the receiver audio output transformer and the splatter-filter choke could not be found on the modulator

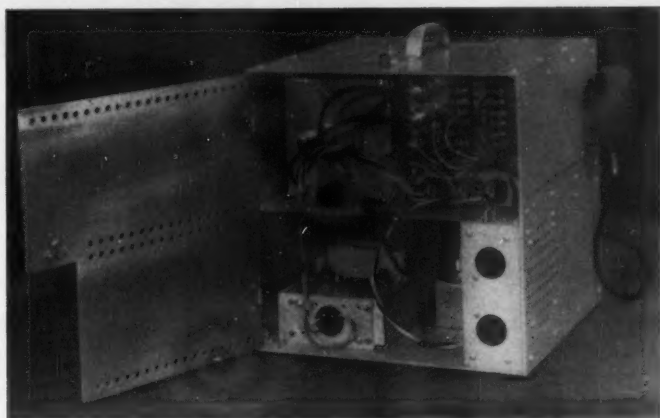
chassis; they are mounted under the shelf in the space above the rear deck of the Command receivers. A 3-inch speaker is attached to a perforated section of the cabinet wall in the area behind the converters.

To facilitate interchanging the units without confusion as to cable connections, all converters use 4-prong Jones connectors, while 8-prong connectors are used for the transmitters. The receiver is connected into the control system by means of a 6-prong connector. R.f. connections are made with RG-58A/U cable and SO-239 coax receptacles and mating plugs, although phono connectors would serve just as well and occupy less space.

Antennas

Various types of antennas may be used for portable work. Some of those that have been used with this transmitter will be described briefly as suggestions. On 2 meters, I use a 19-inch whip and also a 3-element Telrex snap-out beam clamped to the top of a photographer's lamp

Rear view of the portable station showing the hinged rear door and power-supply connectors.



stand. On 6 I use a halo at the home station, but when traveling I've used the simple Zepp arrangement shown in Fig. 5. The feeder is a 43-inch length of 300-ohm TV ribbon. The radiator may be a single wire 108½ inches long, or it can be made of 300-ohm ribbon with the conductors tied together. I have made the whole thing from a single length of 300-ohm line, but found it advisable to leave the web intact

at the junction of the feed line and antenna, as shown in Fig. 5B, to maintain physical strength. With a length of string and a couple of safety pins, the antenna can be pinned up between two window curtains at any place where you happen to stop. (I even got away with this arrangement at my sister-in-law's — but be careful!)

For 10 meters, I have a center-loaded whip about 4 feet long. I've also used a random-length

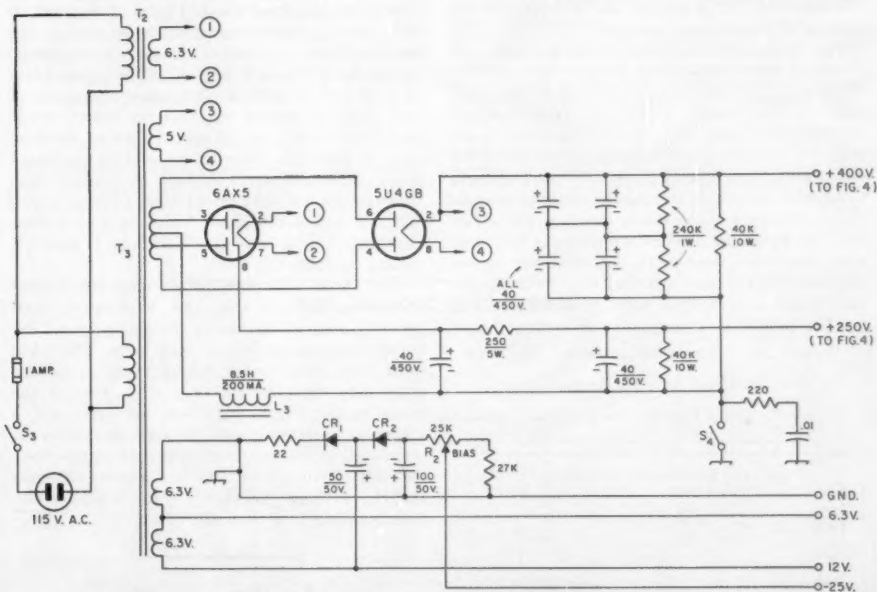


Fig. 3—Circuit of the dual power supply. Capacitances are in $\mu\text{f.}$ and capacitors (except 0.01 $\mu\text{f.}$) are electrolytic. Resistances are in ohms, and resistors are $\frac{1}{2}$ watt unless indicated otherwise.

CR₁, CR₂—Silicon or selenium rectifier; approx. 40 volts d.c. output, 5 ma. (International 1N1636 or similar).

L₃—8.5-hy. 200-ma. filter choke (Stancor C-1721 or similar).

R₃—Adjustable resistor or control, $\frac{1}{2}$ -watt or more.

S₃, S₄—S.p.s.t. toggle switch.

T₂—6.3-volt 1.2-amp. filament transformer.

T₃—Power transformer: 525 volts r.m.s. each side of center tap, tapped at 425 volts, 250 ma.; 6.3 volts, 3 amp.; 6.3 volts, 3 amp.; 5 volts, 3 amp. (UTC S-40).

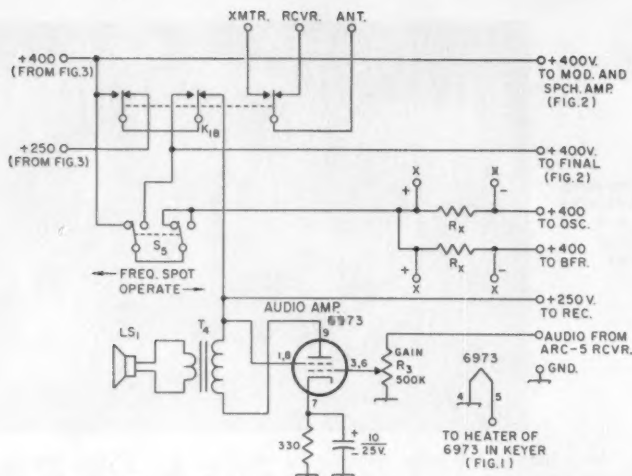


Fig. 4—Control circuit of the modulator section. Capacitance is in $\mu\text{f.}$ and capacitor is electrolytic. Resistance is in ohms and resistor is $\frac{1}{2}$ watt. Terminals marked X go to a meter switch; R_X is a shunt appropriate for the desired full-scale meter reading.

K_{1B}—See Fig. 2.

LS₁—3-inch speaker.

R₃—Audio-taper control.

S₅—D.p.d.t. toggle switch.

T₄—Output transformer; 5 watts, 2000 ohms to voice coil

wire. Some day I hope to get around to making a "Wonder-Bar."² (I bought the TV antenna for making it about two years ago!) This should go nicely on the stand I use for the 2-meter job.

On the lower frequencies, I try to use a dipole, especially if I'm staying put for a few days. If I plan to hop bands, I use the parallel-dipole arrangement³ fed with RG-59/U. I've found that a 75-foot length of feed line is sufficient for most cases, but I usually carry a 30-foot extension along with me in case it is needed. I never seem to find a situation where there is space for a full 130-foot dipole, so most of my portable 80-meter work has been done with the 40-meter dipole with the coax conductors tied together and the system fed as a random wire. It works, but the trouble with this arrangement is not that it is

² Bishop, "The 'Wonder-Bar' Antenna," *QST*, Nov., 1956.

³ See *ARRL Handbook*, Antenna Chapter.

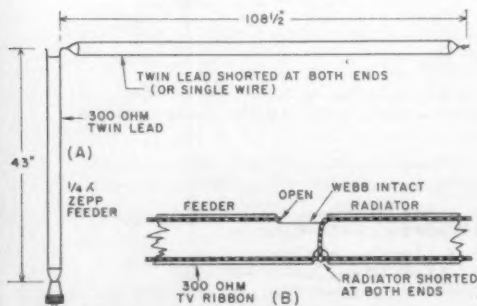


Fig. 5—Sketch showing the portable 6-meter antenna used by the author.

difficult to feed, but that it usually depends on a good ground connection. This may be hard to find, even in a well-engineered home station. On the road, such a thing is virtually nonexistent. In one hotel where I stopped, what appeared to be a nice short ground connection proved to be very poor. It turned out that the resort owner had installed sections of rubber hose in the pipe lines to reduce hammering noise from the water pump! However, don't let such things stop you. I've had good results on 40 with 15 feet of wire laid out across the floor. You can feed almost anything if you have a wide-range L network using a tappable coil.

I've taken this portable package on several vacations. On one trip, the 40/80-meter unit provided many enjoyable contacts from the Adirondacks to my friends back home. The v.h.f. units have been useful during visits to eastern cities, and comprise the only v.h.f. gear at the home station. With clamp-on antennas and a transistor power supply, the unit will serve for occasional mobile work when placed on the front seat next to the driver. I've had a lot of fun with this rig. Perhaps you would enjoy a similar one incorporating your own pet ideas.

Q5T-

Strays

Looking for a list of broadcast stations, together with their frequencies and powers? Available for a dollar from Vane A. Jones Co., 3749 N. Keystone Ave., Indianapolis 18, Ind. Ask for *Jones North American AM-FM Radio-TV Station Listings 1961*.

1961 VE/W Contest Announcement

September 23-25

THE Montreal Amateur Radio Club again invites participation of all W and VE stations in the 1961 VE/W Contest to be held from 2300 GMT Saturday, September 23, to 0459 GMT, September 25.

A "CQ VE" by a U. S. station should yield a VE contact, while VEs try to raise Ws with a "CQ W." Exchange contact serial number, RS(T) report, and ARRL section. Yukon-N.W.T. (VE8) counts as a separate section. *Example:* W5KC called VE2NI, who sends "W5KC de VE2NI NR 5 579 QUE K," and W5KC replies with "VE2NI de W5KC R HR NR 7 589 LA K."

Follow the log sample shown below. Please don't write to ARRL or MARC for log forms, as they are not available.

The over-all contest winner earns a handsome trophy, with certificates going to the top scorer in each section.

Check the rules which follow very carefully. To be eligible your log must be in the hands of the MARC Contest Committee by November 1. We weren't advised where to send your logs but the club secretary should be a good bet: Miss Ethel Pick, VE2HI, 535 Lansdowne Avenue, Westmount, Quebec, Canada.

Rules

1) Any single-operator station in the 72 ARRL Sections may participate. Yukon-N.W.T. (VE8) also counts as a separate section. An amateur may enter as mobile, portable,

or fixed, but in only *one* category. Multiple-operator stations are not eligible to compete.

2) All contacts must be made during the period from 2300 GMT Sept. 23 to 0459 GMT Sept. 25, with a total operating time of no more than 20 hours for each entry. Times on and off the air must be clearly shown in the log.

3) Canadians will work only amateurs in the U. S. and Possessions, and vice versa. VE/VO-to-VE/VO and U. S.-to-U. S. contacts do not count. A station may be worked once on phone and once on c.w. on each frequency-band.

4) The exchange consists of a QSO number, RS or RST report, and ARRL Section. Example of W5KC's message to VE2NI: "VE2NI de W5KC NR1 579 LA."

5) *Scoring:* Count two points for a complete exchange of information; incomplete contacts do not count (no fractional breakdown of the two points per QSO). For final score, VE/VO stations will multiply their total contact points by the number of ARRL sections worked in the U. S. and Possessions, and then by the appropriate power multiplier listed below. For final score, W/K amateurs will multiply their total contact points by the number of Canadian areas (maximum of 9: VE1-VE8 plus VO), then by 7.22 (ratio of U. S.-to-Canadian Sections), then by the appropriate power multiplier, and then by a 2.5 provisional multiplier (based on the ratio of U. S.-to-Canadian log entries received in previous contests). All stations using power inputs of 20 watts or less receive a power multiplier of 2, those using from 31 through 100 watts receive a power multiplier of 1.5, and those using over 100 watts receive a power multiplier of 1.

6) Each entry must be accompanied by the following signed declaration: "I hereby state that my station was operated strictly in accordance with the rules of the contest and governmental regulations, and I agree that the decision of the contest committee of the Montreal Amateur Radio Club, Inc., shall be final in all cases of dispute."

7) To be deemed valid, all entries must follow the form shown in the sample log and must be received no later than midnight, November 1, 1961. They should be sent to Miss Ethel Pick, VE2HI, MARC sec'y., 535 Lansdowne Avenue, Westmount, Quebec, Canada.

QST

LOG, 1961 VE/W CONTEST

W5KC		C.W.								La.				
Call	C.W., Phone, or Both								ARRL Section					
Date/Time On or Off Air (GMT)	Time of QSO	NR Sent	My Stn.	RST Sent	My Stn.	Freq. Band	Emission	Power Input	NR Recd.	His Stn.	RST Recd.	His Stn.	New Sect. Wk1.	QSO Pts.
Sept. 23														
On 2300	2300	1	W5KC	579	La.	3555	A1	75	1	VE2NI	599	QUE	1	2
"	2301	2	"	569	"	"	"	"	2	VE3BFF	579	ONT	2	2
"	2302	3	"	579	"	"	"	"	1	VE2ASW	579	QUE	-	2
"	2313	4	"	559	"	7010	"	"	3	VE1EK	579	MAR	3	2
Off 2315														
Total operating time: 15 min.		Bands used: 3.5 & 7 Mc.						3 sects., 8 pts.						
<p>Claimed score: 4 QSOs × 2 (points per contact) × 3 (different sections worked) × 7.22 (section-balancing multiplier for all W/K stations) × 1.5 (power multiplier for 75 watts input) × 2.5 (provisional multiplier for all W/K stations based on ratio of U. S.-to-Canadian logs previously entered) = 650 (rounded).</p> <p>I hereby state that my station was operated strictly in accordance with the rules of the contest and governmental regulations, and I agree that the decision of the contest committee of the Montreal Amateur Radio Club, Inc. shall be final in all cases of dispute.</p>														
Signature.....										Call.....				

A.M. with Collins S.S.B. Units

A 35-Cent Adapter for Local or Short-Haul Duty

BY J. R. POPKIN-CLURMAN,* W2LNP

IN spite of all of the advantages of s.s.b., there are times when a little a.m. comes in handy — such as for periods when there is no s.s.b. activity, or when it is desired to join a local net working a.m. only. To overcome this handicap, the author has worked out a simple scheme for his Collins KWM-2 that permits reinserting the carrier so that the output stage may be operated as an a.m. linear. It should be possible to use a similar arrangement with the KWM-1 or the 32S-1.

With the KWM-2 or 32S-1, the modification provides carrier with either upper or lower sideband; with the KWM-1 the output is carrier with upper sideband only. At least 20 watts of a.m. is obtainable from any of these units.

No hole drilling or internal soldered connections should be required, and the only components needed are a snap slide switch with mounting bracket, a 2- to 4- μ f. fixed capacitor or "gimmick" (value not critical), and two approximately 1-foot lengths of stranded hookup wire.

Circuit Connections

The simplest way to reinsert the carrier is to bypass the balanced modulator and mechanical filter by using the capacitor to couple the b.f.o. (carrier generator) feed directly to the grid of the first transmitter mixer. Internal soldered connections can be avoided by using the old dodge of inserting small wires in tube-socket prongs. There is enough tolerance in the miniature socket pin holes to accommodate a few strands of the hookup wire as well as the tube pins. However,

* 134 Wheatley Road, Brookville, Glen Head, L. I., N. Y.

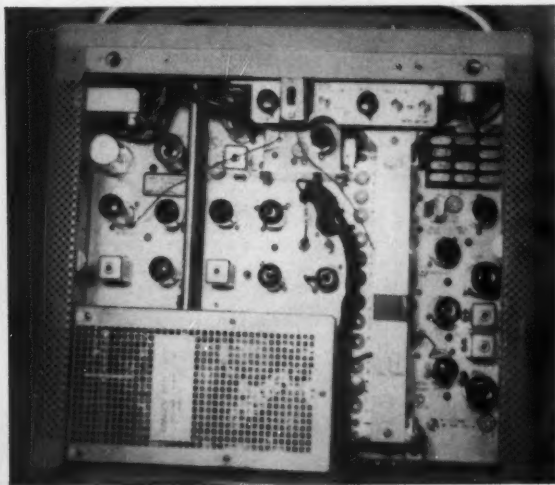
Without the need for altering the original unit in any way, the simple addition described here provides means of obtaining 20 to 25 watts of a.m. carrier from KWM-1, KWM-2 or 32S-1 s.s.b. units.

in the case of the KWM-2, the b.f.o. and first-mixer tubes are equipped with shields, so it is more convenient to make the connections at the sockets of the product detector and receiver second mixer which have no shields, but where equivalent points in the circuit are available.

At one end of each of the two pieces of hookup wire, the multistrand conductor is reduced to appropriate size by removing some of the strands for a distance of $\frac{3}{8}$ -inch or so. The remaining few strands are retwisted together and are inserted in the socket holes before replacing the tubes. Connections should be made to the cathode (Pin 9) of the 6BN8 product detector V_{15B} with one wire, and to the plate (Pin 7) of the 6BN8 second mixer V_{17B} with the other wire. Make certain that there are no loose wire ends or strands left exposed that can short to another socket pin or to the chassis.

Switch Mounting

The switch is mounted on a bracket fastened under the retaining nut of the S-meter zero-set potentiometer, or the VOX gain control. The bracket is bent to shape, as shown in Fig. 1, so that the switch button protrudes through the



The a.m. slide switch, upper center, is mounted on a bracket fastened under the retaining nut of the S-meter adjustment potentiometer. The switch button protrudes through the finger hole in the lid when the latter is closed. Wires from the switch run to the product detector, left center, and the second mixer tube, lower right.

finger lift hole of the cover of the KWM-2. Thus the switch may be operated without opening the lid, but it does not interfere with raising the cover when desired. The switch terminals should be bent as shown in Fig. 1, and a piece of tape placed underneath to keep the terminals from shorting on the shelf. Before mounting the switch, the capacitor should be soldered across the two stationary or "on" contacts, and the two wire leads to the arms of the switch. This puts the two poles of the switch in series to reduce the capacitance in the open or s.s.b./c.w. position.

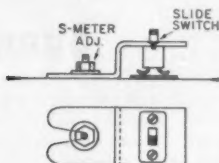


Fig. 1 - Sketch showing the mounting of the switch. The switch is a d.p.s.t. snap slide switch (Wirt SW725 or similar). The notch in the bracket fits under the retaining nut of the S-meter adjustment potentiometer.

The leads from the switch to the tube sockets should be run as directly as possible. In the case of the wire from the plate of the second mixer, V_{17} , the most direct path runs through the movable exciter tuning rack. The lead is held away from the movable section by taping it to the under side of the stationary frame. To minimize the capacitance to ground at this tie-down point, a small piece of sponge rubber may be used between the wire and the frame.

Adjustment

With the switch in the open position, the transmitter is tuned up in the same manner as for s.s.b. or c.w. until the final is fully loaded. The switch is then closed. If the coupling capacitance chosen is just right, the plate current should drop to about half of the fully-loaded s.s.b. or c.w. value. If the plate current is higher than this, it may be reduced by slightly detuning the exciter. If desired, a variable capacitor having a range of 1.5 to 5 $\mu\text{f.}$ may be used in place of the fixed capacitor. However, I did not find the value to be highly critical.

Considerably less audio is needed than for s.s.b. A speech signal should cause the plate current to flick upward. If the current flicks downward, this indicates that either too much carrier is being inserted, or that the loading is improper. (The input to the final should not be allowed to remain at the full c.w. input with carrier applied, since this will overload both the power supply and the final-amplifier tubes.)

Reception of a.m. signals is by the exalted-carrier method. There may be a very small loss in receiving sensitivity because of the extra feed-through of the carrier. If greater sensitivity is required, it may be desirable to turn the carrier-

insertion switch off during receiving periods. However, if the switch is left closed, it should be possible to copy all signals, except those "way down in the mud," satisfactorily.

In some cases better results will be obtained on one sideband than the other since the outputs of the two b.f.o. crystal oscillators may not be equal; also, the setting of the carrier on the slopes of the mechanical filter may not be at the -20-db. point.

QST

Silent Keys

It is with deep regret that we record the passing of these amateurs:

WA2BXT, Louis Hahn, Rutherford, N. J.
W2IDR, Eric H. Foster, Freehold, N. J.
W2NUP, Joseph C. Obinger, Flushing, N. Y.
W2RJY, Henry G. Onkes, Alden, N. Y.
W3FI, Franklin Mousley, Havertown, Penn.
W4EZO, William J. C. Belbey, Port Charlotte, Fla.
W4RGF, ex-W9PNV, George B. Ashton, Winter Haven, Fla.
W5ALB, Forrest E. Yaeger, Oklahoma City, Okla.
W6PWB, Arthur S. Gunther, Los Angeles, Calif.
W6TI, Horace R. Greer, Oakland, Calif.
W7DC, James A. Rutledge, Tacoma, Wash.
W7LNS, Alva A. Deschenes, Butte, Mont.
W7MRG, Richard H. Radelet, Elma, Wash.
W8DAH, Otis L. Booher, Willard, Ohio
W8DWH, Murrell J. Kelley, Geneva, Ohio
K8JQD, Gibson E. Guernsey, Dayton, Ohio
W9AQC, Clair C. Gould, Indianapolis, Ind.
W9HYK, Edwin L. Chapman, Carbondale, Ill.
ex-W9PSV, Bernard D. Rittman, Fort Wayne, Ind.
K9RJF, James B. Durham, Berwyn, Ill.
W9VRN, Kenneth T. Olsen, Mt. Prospect, Ill.
K9YFG, Bert L. Ferguson, South Bend, Ind.
W9BUQ, Lloyd C. Elledge, Des Moines, Iowa
W9EOD, Hugh W. Forman, jr., Pittsburg, Kans.
W9LAC, Dr. Edgar L. Carter, Burlington, Iowa
W9SBT, Floyd F. Beranek, Iowa City, Iowa



25 Years Ago
this month

September 1936

... The technical fare 25 years ago included a dissertation on the Kennelly-Heaviside Layer, some trick crystal circuits, how to use a 316A tube below one meter, volume compression for phone, oscillator-mixer design considerations, plus the usual hints and kinks. ... The eighth ARRL Dx contest scores were reported—high scorer was W4DHz with 226 QSOs in 69 countries. No. 2 man was W3SL, while third was W2UK, who is now KH6UK and a v.h.f. man of some note.

... It was reported that FCC had standardized the amateur code examination, the qualifying speed having been upped from 10 to 13 w.p.m. If an applicant failed, he could not try again for 90 days.

... In the year ending with February, 1936, the FCC reported, 62 per cent of the complaints of amateur interference with broadcasting were traced to phone work, and of this some 70 per cent related to work on 160 meters.

... It was reported that there were now a total of 160 members in the Worked All States Club, with OAAJ being the first outside of the United States and Canada to qualify for WAS. Member No. 160 appears to have been an L. A. Morrow, W9VKF.



Part of the crew of W3WJC/3, with the two 10,000-Mc. stations used. Left to right, K3KRU, W3WJC and K3AB5. Operation was in a pavilion on Mt. Penn, Reading, Pa. Eleven operators worked 457 stations on 50, 144, 220 and 10,000 Mc. for 27,780 points.

June

V.H.F. Party

Summary

THROW away the book on spring and fall v.h.f. parties — we start over in every record category in reporting the activities of June 10-11, 1961! Booming v.h.f. interest everywhere, and a continent-wide sporadic-E opening that ran almost continuously for the whole contest week end combined to rack up new highs in activity, geographical coverage, scores, section multiplier totals, number of portable stations in the field. Check any category you can think of and you'll find nothing in the 22-year record of v.h.f. parties sponsored by ARRL to equal the June, 1961 affair.

The 558 valid logs exceed the largest previous spring-fall total by a wide margin. Whopping section multipliers (120 stations in all parts of the country had 35 or better) boosted scores to astronomical levels. Only seven of all the ARRL Sections are missing from the tabulation, and only Alaska, Hawaii and Canal Zone cannot be found in one or more logs. Participation? Approximately one-third of all entrants are portable or multiple-operator stations. A check of the latter shows that they average just over six people per station, so the official entries alone account for some 1200 hams busy on the v.h.f. bands. Add the undetermined (but considerable) number who join in the fun but don't send in logs, and you begin to see how large the world above 50 Mc. is growing these days.

Few portable setups for Field Day, 2 weeks later, would rival that assembled on Pack Monadnock Mountain, Peterboro, N. H., by the Waltham Amateur Radio Association, W1MHL/1. Tackling logistics problems not unlike those of a small army setting out on maneuvers, these fellows outdo themselves and all rivals, year after year. W1DDN supervised and coordinated the entire operation. W1DDF handled the 50-Mc. department, supplying his v.f.o.-controlled 4-400A rig, converter and 75A-4 receiver, plus stacked 5 element Yagis. He and a staff of three expe-

rienced contest operators worked 581 stations in 48 ARRL Sections, a total not approached any other 6-meter effort of the contest. W1QXX ran the 144-Mc. show, furnishing his 600-watt 4X250B rig, converter and HRO-50, and a 44-element array. He and his three-man staff worked 439 stations in 15 sections, also completely outclassing any other 144-Mc. effort. W1GEF provided a 200-watt 220-Mc. station, converter and HQ-170, and a 44-element array, and with the help of W1DDN and W1OOP worked 33 stations in 11 sections. W1PZA handled the 432- and 1296-Mc. departments, with a 4X250B on 432 and a 2C39 tripler to 1296. These, his converters, and his HQ-129 were tied to a 64-element array for 432 (W1QMN) and 4-foot parabolic antenna supplied by W1OOP. The 20-in-9 and 9-in-3 turned in by the u.h.f. setups didn't hurt the W1MHL total one bit.

A new feature this year was separate spotting positions for 50 and 144 Mc. These completely separate receiving setups had their own beams and their operators ran down new calls and sections and fed this information to the communicators. Did it pay off? W1MHL/1 worked 1082 stations and ran up a section multiplier of 86, for 99,158 points! The reward for this effort is slim — a piece of paper declaring them winners in the multiple-operator class in the New Hampshire section. More important than the wallpaper, of which WARA already has plenty, is the satisfaction of having done a tremendous cooperative job — one that no group will ever surpass by a mere stroke of luck. They were lucky this time, in that conditions were favorable to an extent never before encountered, but W1MHL was "there firstest with the mostest," as they have been many times over the years, ready to do a topnotch job, come what may!

Leading this league is no pushover for W1MHL. They have had some nearby competition in several contests from the Merrimac Valley Radio

Club, W1NBN/1, and this party was no exception. Using somewhat similar tactics, but not so large a staff, W1NBN/1, atop Mt. Wachusett, Princeton, Mass., worked 774 stations on 50-1215 Mc., and amassed a multiplier of 81, for 67,473 points. W2PEZ/2, Northern New Jersey, had 630 — 74 — 49,728, also on the same bands. Other all-out portable efforts included those of W3JZY/3, Md.-Del.-D.C., W3WJC/3, E. Pa., W2LW1 2, E. N. Y., WA6AJT/6, Santa Barbara section, W6NSN/6, Los Angeles section, and scores of others.

The top score by a single-operator station was also turned in by a portable, W1UIZ/1, atop Mt. Equinox, Vermont. George used all bands from 50 to 1215 Mc. to work 389 stations. With a multiplier of 69, he had 29,335 points. W4LIP, Miami, Fla., used the country-wide skip on 50 Mc. to work 396 stations in 39 sections, for 15,048 points and the E. Fla. wallpaper. This is believed to be an all-time one-band record, though several operators beat this with multi-band work. K1IZM, Marlboro, Mass., lead all home stations and won the E. Mass. award with 387 in 49, for 18,963 points, on 50 and 144 Mc. K3IPM led in Eastern Pa., with 334-47-15,698. W0AXU, Marion, Iowa, formerly W7VMP, used the skip in all directions to rack up a 314-47-14,758 total for the Iowa award.

WA6JMQ set up a mark for future generations to shoot at, in working 54 sections on 50 Mc. With 258 contacts this gave him 13,922 points, second in the country for one-banders. Others with fat section totals on 6 included K4JPD, Georgia, 48; K5TKR, Arlington, Texas, 47; W5DNL, New Orleans, La., 45; and K9LBQ, Wisconsin, W5UQR, Louisiana, W0WKB, Iowa, and K4RNG, E. Florida, with 44 each.

With all this emphasis on 50-Mc. DX, we should not forget the important part played by the higher bands. They were important in the



This veteran team, left to right, W6SDM, K6DAH and W6ELT, have worked in June V.h.f. Parties from Mt. Abel, San Joaquin Valley Section, for 6 years. They worked 129 stations in 36 sections, for 5238 points.

high scoring of all the leaders, and some respectable scores were made on 144 Mc. alone. K1CRQ, Bethlehem, Conn., led all 2-meter men with 228 contacts in 16 sections, for 3688 points. K2LNS, Northern New Jersey, worked 210 in 15, for 3240. And speaking of higher bands, K1DIT must have set a record by using 10 bands, doing two-way work on all amateur frequencies from 50 to 21,000 Mc.!

So far we've cited the efforts and results of the winners and near-winners, but the real winners were the thousands of hams who got into fray for the fun of working the v.h.f. bands under ideal conditions, regardless of whether they made the headlines or not. Perhaps a few excerpts from letters that accompanied logs tell this story better than we could.

K2HLA — "Competitive spirit was terrific — best contest yet!"

K0CER — "A QSL-printer's dream come true!"

K0VQM — "What a ball! Worked 17 ARRL Sections with 4 watts input, but couldn't get my own — Iowa!"

W8NOH — "Sure was nice to hear so many using c.w. on 6."

K1JFN — "Worked 28 sections on 6 with my beam stuck southwest."

W9YT — "Receiver so overloaded with strong signals on 6 that we disconnected the beam at times and used a short piece of wire for receiving."

W1EUJ — "Antennas for W1NBN/1 were erected in the midst of very wet clouds atop Mt. Wachusett — but weather cleared nicely as soon as all outside work was done!"

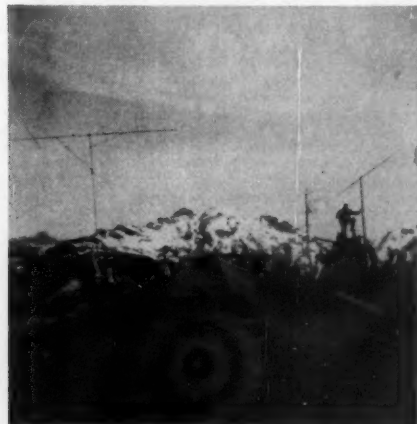
W6ZOP/6 — "It was disconcerting to hear low-lying stations in the Los Angeles basin working sections on 6 that I couldn't hear. This went on most of the time." (A mountain location is not always beneficial — Ed.)

W3WLJ — "Wish that more K, W and WA6s knew what ARRL Section they are in. Worked 5 that insisted that they were in the 'Southern California' Section."

WA2KZV — "These contests improve operating ability and promote v.h.f. interest. You'll be hearing from us (Metuchen YMCA Radio Club) again."

W7RT — "Worked 31 states on 50 Mc., a fair start on 50-Mc. WAS in a single week end."

K4RNG — "Here in Miami we had to work through QRM from the entire country at times. Tried for high section total, spending a lot of time dial-twiddling. Ended up with 44."



Snow-capped peaks provide a spectacular backdrop for W7RDY/7 atop Green Mountain, Wash., top-scoring portable station in the Northwest. Using 50 and 144 Mc., they worked 204 stations for 7344 points.

W6NLZ — "101 of my 140 contacts were on c.w. Who says v.h.f. men don't know the code?"

VE6DB — "At times we heard all U. S. call areas simultaneously, but could not work East Coast sections. Other areas were often heard for 2 to 3 hours at a time when they could not be raised."

W6JMQ — "Best 50-Mc. opening ever. Worked 54 sections and heard but could not work W1AW."

Several VE3s — "More c.w. on both 6 and 2 would help our totals. We all need more U. S. operators who will look for us."

WA6AJT — "Had to quit early because we interfered with the Frazier Peak Forestry Service station on 48 Mc. Our quitting did not solve their problem, however. They still had trouble from stations on the same frequency in Texas and the Middle West."

VE5BY, Yellowknife, NWT — "Lost some effectiveness because many operators will not copy c.w., forcing me to shift to phone to make contacts. Can run 150 watts c.w., but only 50 on phone."

W1HDQ/5 — "Used the complete v.h.f. station now running in QST to work 18 ARRL Sections on 50 Mc. from portable location near Albuquerque, N. Mex. Some fun to be rare and get calls from both coasts at once!"

XEIOE (W8NRM) — "Although I realize that we are not eligible for an award in this contest, we thought the gang might be interested to know that we worked 76 stations in 27 ARRL Sections, for an unofficial total of 2262 points."

VEARE — "Thanks for arranging this fine contest. Activity in this area is increasing, and we hope to see many logs from VE4land."

W6FZA — "In retrospect, one can draw two fine conclusions from the melee: (1) V.h.f. Activity, especially on 50 Mc., is excellent throughout the country, even though we are approaching the bottom of a sunspot cycle. (2) This activity is healthy and skillful, as evidenced by random scatter contacts, multiple-hop Es work, and the terrific activity in the c.w. subband. Anyone who missed this extraordinary contest missed a thrill that may never come again!"

— E. P. T.

SCORES

In the following tabulation, scores are listed by ARRL Divisions and Sections. Unless otherwise noted, the top scorer in each section receives a certificate award. Columns indicate the final score, the number of contacts, the section multiplier, and the bands used. A represents 50 Mc.; B, 144 Mc.; C, 220 Mc.; D, 420 Mc.; and E, 1215 Mc. or higher. Multiple-operator stations are shown at the end of each section tabulation.



Parabolic antenna used at W2PEZ/2, station of the 6220 Club, near West Milford, N.J. Highlight was a 60-mile 1215-Mc. contact with W2LW1/2, using APX-6s both ways. Score: 630-74-49,728, third ranking in the country among multioperator stations.



Crew of the West's top-scoring station in the June V.H.F. Party. Left to right, W6FNE, WA6MFH, WA6GNG, the generator, WA6DJ8 and WA6AJT. Operating from Frazier Peak, in the Santa Barbara Section, they worked 400 stations on 50 through 1215 Mc., for 20,200 points. (Photo by K6RUK)

ATLANTIC DIVISION

Eastern Pennsylvania

K3IPM 15,699-334-47-AB
K3HGA 10,678-281-38-AB
K3HNP 10,656-288-37-A
K2IXJ/2 9,408-183-48-ABC
W3CL 7,160-163-40-ABC
K3KFD 7,006-226-31-A
K3JRO 4,888-132-34-AB
K3ISH/3 2,750-110-25-AB
W3ETB 1,640-82-20-A
K3KEL/3 1,638-79-21-A
W3ARW 1,633-55-23-B
K3IUV 1,206-59-18-AC
K3ATX/3 630-42-15-A
K3HNG 343-49-7-A
K3HOP 140-28-5-A
W3NOK 136-17-8-B
W3WJC/3 (11 ops.)
27,700-457-60-ABCE
W3HZU (10 ops.)
21,615-389-55-ABC
W3CCX/3 (15 ops.)
17,114-382-43-ABC
W3OI/3 (7 ops.)
16,192-339-46-ABC
K3HRF/2 (K3HRF, WA2s
MJT MVE)
9,650-193-50-AB
W3YRT/3 (4 ops.)
9,588-204-47-AB
W3QQB/3 (W3s FDH JUZ
GFN)
7,913-191-41-ABC
W3KXN/3 (6 ops.)
5,976-166-36-AB
K3MTK (9 ops.)
4,669-203-23-AB

Mid-Atlantic

W3NG 8,200-200-41-AB
W3GCO 4,680-156-30-AB
W3UCR 4,495-155-29-AB
W3CGV 4,182-108-34-ABCD
K3DGG 4,125-125-33-AB
W3LKU 2,700-108-25-AB
W3JNE 1,501-79-19-AB
K3CPA 1,044-58-18-AB
K3EHS 924-66-14-A
K3MOY 876-73-12-A
W3WOD 682-62-11-B
K3AMG 648-54-12-A
W3HB 469-67-7-B
K3CRD 441-63-7-B
W3DFS 320-40-8-A
W3CJT 301-43-7-B
W3MMC 280-40-7-A
K3GMP 260-25-8-A
W3CPM 196-49-4-B
K3AEN 87-29-3-B
W3ZSR 132-33-4-B
K3NOB 123-41-3-B
W3JPD 120-20-6-A
W3FLU 92-23-4-A
K3JOY 72-24-3-A
K3PNI 72-24-3-A
K3NOG 56-28-2-A
K3LLR 22-11-2-A

WESTERN DIVISION

W3JZY/3 (9 ops.)
33,666-525-62-ABCD
K3HFV (4 ops.)
9,652-251-38-ABC
W3JIC (W3s JIQ DWU)
2,646-126-21-AB
K3MAU (K3s MAU GFJ)
2,375-125-19-A
K3ARN/3 (K3s ARN ACL,
W3BFE)
1,704-142-12-B
W3KZH (W3s KZH MBZ)
1,496-88-17-AB

San Jose

W2REB 9,588-204-47-AB
W2ICW 2,480-80-31-AB
W2HLY 2,108-56-34-ABC
W2HGW 570-67-10-B
W2KILZ 504-56-9-B
W2MEO 40-10-4-A
K2ITP (K2s ITP ITQ)
19,894-343-58-ABC
K2BWR (K2s BWR ZRJ)
3,000-100-30-A

Western New York

W2UTH 8,400-210-40-AB
K2ERG 6,888-168-41-AB
K2YCO 6,084-169-36-AB
W2ELX 5,049-144-33-ABC
K2GUG 4,470-147-30-ABC
W2AKN 3,996-129-31-A
K2ZEV 3,750-125-30-AB
K2DBB 3,534-114-31-A
K2MLF 3,030-101-30-A
WA2KND 2,945-95-31-A
W2CTA 1,311-69-19-AB
W2NJE 1,064-56-19-A
K8PNN/2 204-34-6-A
W2HCE 198-33-6-A
W2SIC 156-39-4-B
W2NUG 140-20-7-A
W2ALI/2 (4 ops.)
18,727-282-61-ABCD
K2RRM/2 (9 ops.)
7,732-281-52-ABC
W2MAU/2 (22 ops.)
16,907-295-53-ABC
K2HWC (7 ops.)
13,950-305-45-ABC
W2ALR/2 (5 ops.)
12,956-312-41-ABE
W2JGJ/2 (9 ops.)
11,515-225-40-ABC
W2JJO (11 ops.)
12,510-278-45-AB
K2POX (11 ops.)
11,368-228-40-ABC
W2PGC/2 (7 ops.)
6,804-197-32-AB
W2ZKF (5 ops.)
5,088-153-32-ABC
K2EAO/2 (17 ops.)
4,268-194-22-AB
K2QVB/2 (K2QVB, W2EJO)
3,944-131-29-AC

(Continued on page 148)

Illinois — The Egyptian Radio Club will hold its annual Hambooree on September 24. There will be games for young and old alike and prizes galore. Take Route 66-40 to the Chain-of-Rocks Navigational Canal near Granite City, Ill. and follow the signs to the Club grounds. Same place, and fun as always. Come out and make a day of it. Plenty of food and drinks on the grounds. For further information contact R. E. Rice, W9PWI, c/o Egyptian Radio Club, R.F.D. #1, Granite City, Ill.

Illinois — The Peoria Area Amateur Radio Club Hamfest will be held on September 17 at Exposition Gardens on the northwest edge of Peoria (same as last year). Follow route 88 north to Northmore Road at State Police Headquarters. Drive west 2 miles following Hamfest signs. Plenty of space for free swap section and parking. Food available on grounds. Free coffee and doughnuts 0730 to 1000 CDT. Advance registration (until Sept. 9) \$1.00. Registration at gate \$1.50. For tickets and information write Steve Perry, K9AXG, 505 E. Jefferson St., Washington, Illinois.

Maine — The Rockland hamfest will be held at the American Legion Hall in Rockland on Sunday, September 10. Doors open at 9:30 A.M. Turkey dinner, swap table, and mobile hunt. Tickets \$3.00 at the door, \$2.50 by advance reservation. Reservations should be mailed to Dick Glidden, K1NYY, Waldoboro, Maine.

Massachusetts — The Eleventh Annual New England DXCC Meeting will be held Saturday, October 7, 1961 at Motel 128 on Route 128 at Route 1 South (Exit 57) Dedham, Mass. Cocktail Hour starting at 5:30 P.M., Dinner at 7:30 P.M. Cost: \$5.50 per person for a Roast Beef Dinner, including gratuity. Deadline for reservations is October 1, 1961. Make check payable to Charles L. Burgoyne, Box 307, Hanover Center, Mass.

New Jersey — The South Jersey Radio Association will sponsor its annual gala hamfest on September 10 at Mollia Farms, Malaga, N. J. Rain date will be September 24. Advance registration for non-club members is \$1.50, with September 4, 1961, the deadline. General admission at the gate, \$2.00. Day's activities will include 2- and 6-meter transmitter hunt and swap shop. For mobiles, there will be talk-in by K2AA on 2, 6, 10, and 75 meters. All are invited to bring their lunch baskets, swapping gear and enjoy a day of fun and excitement. Registrations being handled by Earle Bond, K2OHM, 1173 Concord Drive, Haddonfield, New Jersey.

New Jersey — The Raritan Bay Radio Amateurs, Inc., will sponsor an Auction-fest on Sunday, September 17, starting at 9 A.M. at the Hercules Ball Field and Picnic Grounds, in Sayreville, N. J. Bring the XYL, jr. ops, and friends. Mobile talk-in transmitters will operate on 29.0, 50.25, and 145.41 Mc. Transmitter hunts will be held on 2 and 10 meters from 11 A.M. to 1 P.M. Don't miss our auction, praised by many as one of the biggest and best in New Jersey, which starts at 2 P.M. in the main pavilion, rain or shine. Bring your gear. Food and refreshments will be sold on the premises, with plenty of picnic tables available to

gather the family around. Games and contests will be held for children and adults. Come out early and have fun. For complete details, maps, and information contact Ron Hoffman, K2KFE, 23 Reid St., Sayreville, N. J.

New Mexico — The Caravan Club annual picnic will be held at Pine Flats camp ground in the Monzano Mtns, Rt 10 south of Hwy 66, on Sept. 10. No further info available as of this writing.

New York — The third annual DX dinner sponsored by the North Eastern DX Association will be held at the Town House Motel in Albany on Oct. 7. Tickets are \$5.00 each and reservations should be mailed before Sept. 23, to Frey Spinning, W2TVR, 38 Highland Drive, Albany 3, N. Y.

Ohio — The 24th Annual Stag Hamfest sponsored by the Greater Cincinnati Amateur Radio Association will be held all day Sunday, September 24, at Stricker's Grove, Compton Road, Mt. Healthy, Cincinnati, Ohio. Two meals are provided, at noon and 5 P.M., as well as donuts, hot dogs, snacks and drinks in between, all for the \$3.50 gate fee. Equipment displays, a transmitter hunt, and other interesting attractions. For further information contact Elmer H. Schubert, W8ALW, 3965 Harmer Ct., Cincinnati 11, Ohio.

Ohio — The Findlay Radio Club, W8FT, will hold its annual hamfest on Sunday, Sept. 10, at Riverside Park, in Northeast Findlay. Families welcome. Excellent playground and picnic facilities. Concessions open. Transmitter on 3812 kc. Something special—ladies bazaar. Advance registration \$1.00 or \$1.50 at park. Tickets and information from Clark E. Foltz, W8UN, 122 West Hobart, Findlay, Ohio.

Tennessee — The Delta Radio Club will sponsor a Delta Hamfest on Sept. 30 and Oct. 1 at Twinkle Town airport. This will be a family affair. For further info, contact Lee Casper, K4DJO, 497 E. McKeller Ave., Memphis, Tenn.

Texas — The Central Texas Amateur Radio Club will hold its 6th Annual Hamfest at the Waco, Bryan Club on September 3, from 9 A.M. until 5 P.M. Catering service will be available. For further information contact the Central Texas Amateur Radio Club, P.O. Box 1032, Waco, Texas.

Washington — The Walla Walla Valley Radio Amateur Club (W7DP) will hold its 15th annual all-family picnic hamfest on Sunday, Sept. 17, at Wildwood Park in Walla Walla. We will have a full day program (rain or shine) for all members of the family. Registration 10-12 A.M. Potluck dinner at 12:30 with coffee, pop and dessert furnished by local club. In the afternoon, prizes for best mobiles, best piece of homemade gear, radio bingo, and other awards. For the YL's and XYL's prizes for the best earrings and hats made from radio parts, etc. Prizes and novelties for harmonics. Free swap shop, bring your gear for sale or trade. Displays of all the latest gear. ARRL representatives on hand to answer your questions. "Greased Lightning" and "Pee Pickers" certificates awarded at picnic. There is no charge. Help us to break our record turnout of 290 hams, 29.6 and 3970 monitored to home you in. Listen for W7DP. For more information write Patrick Stewart, W7GVC, 1404 Ruth Avenue, Walla Walla, Washington.

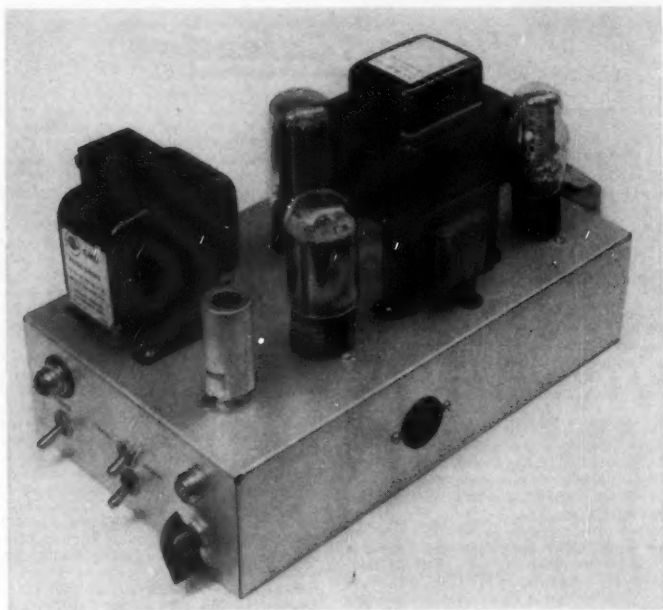
W6CYD, chief of police in Monterey, says that during his 20 years as a policeman he has never had to arrest a ham. A case of zero bias, eh!

In 1936 the call W1FRX was held by a Walter S. Hardwick. In 1955 it was reassigned, going to Richard Hardwick, who is no relation to Walter.

A new epoxy silver solder has been developed by Epoxy Products, Irvington, N. J., for use with components that are heat sensitive, such as transistors and printed circuits. It has low re-

sistivity, no flux residue, and a bond strength superior to that of the usual solders. It will also handle dissimilar metals and aluminum.

The ARRL Board of Directors urges all U. S. amateurs to avoid transmitting in the frequencies 14,335-14,350 kc. to give the DX stations on s.s.b. a better chance to work us and each other. See page 9 of July QST for a full explanation of the request.



The central unit in the v.h.f. station combines the modulator, power supply and control circuits. In the right front portion of the chassis are the 12AX7 speech amplifier (shielded) and 6L6G modulator tubes. At the left is the power-supply filter choke. Near the middle of the chassis are the rectifier tube and the modulation transformer. The power transformer and regulator tube are at the back. Receiving and transmitting assemblies plug into sockets in the sides of the chassis.

A Complete Two-Band Station for the V.H.F. Beginner

Part III — The Modulator, Power Supply and Standing-Wave Bridge

BY EDWARD P. TILTON,* WHDQ

IN describing equipment serially, as is being done here, the author inevitably runs into the problem of covering the various items in a logical manner. There is no adequate solution to this in connection with our v.h.f. station. If you build the tuner first, you have no power to run it, and if you make the power supply and control system first, you have nothing to use it on. The transmitters cannot be operated without the power supply; and if you have built the equipment in the order we have described it, you still cannot operate — the v.h.f. converters are yet to appear! But have patience; the gear is all completed and working nicely. The trouble is that it would take an entire issue of *QST*, if we were to describe it all at once.

Construction of the units described herewith will put you on the air, with phone or c.w., on 50 and 144 Mc., and the station will be complete with all necessary controls and test equipment

* V.H.F. Editor, *QST*.

for transmitting. The main item of interest this time is a modulator, speech amplifier, power supply and control unit. It is the central item of the station, designed so that the transmitter r.f. assemblies plug into its left side and the receiving gear into the right side. In the audio portion a 12AX7 dual triode speech amplifier drives a 6L6G modulator. The microphone may be either crystal or high-impedance dynamic. The power supply for the entire station is included, as are the circuits for send-receive switching. A coaxial antenna change-over relay is mounted on the rear wall. The standing-wave bridge and test meter is a separate unit that will also be described in this issue.

Building the Control Unit

The chassis is 7 by 12 by 3 inches in size. Layout of parts is not critical, so no template for drilling this chassis has been made. If the general physical arrangement shown in the photographs

is used there should be no problems encountered in building the unit. Looking at the oblique view, we see the speech amplifier tube in the foreground. To the left is the filter choke. In back of the 12AX7 is the 6L6G modulator, and in line thereafter are the modulation transformer and the voltage-regulator tube. At the rear of the picture are the rectifier tube and the power transformer.

On the front wall at the left are the main a.c. switch, S_1 , and a red pilot light. The upper of the two toggle switches is the dual send-receive control, S_2 . This switches the high voltage from transmitter to receiver, and also applies a.c. to the coaxial relay, which is mounted on the back of the unit (see bottom view). The second switch, just below the send-receive control, is used to apply voltage to the receiver while the transmitter is on, if desired. This enables the operator to monitor his transmissions, and also can be used for duplex operation (above 51 Mc.) if separate transmitting and receiving antennas are used. More on this later. At the right are the microphone connector and the gain control for the speech amplifier.

From the bottom view it is obvious that there is plenty of room for the parts. All leads that are not part of the components themselves are made with shielded wire (Belden 8885). This may not be entirely necessary, but it is a good precaution against r.f. feedback and hum troubles. Liberal use of terminal strips makes for a neat and trouble-free unit. Note that there are octal power sockets on each side of the chassis. These carry the heater and plate voltages for the transmitters, J_3 , left, and receiving gear, J_2 , right, as the unit is viewed from the front.

In the bottom view the coaxial relay is seen on the rear wall of the chassis. Note that the a.c. terminals are bare in this picture. Before the unit is put into service these leads should be covered securely with plastic tape or insulated sleeving. The coaxial connectors come in close proximity to them when the cables are connected, and a shock is likely if the relay terminals are not protected. In the upper left of the picture is the power transformer. Below it are the regulator tube socket and one of the electrolytic filter capacitors. This capacitor was added during the

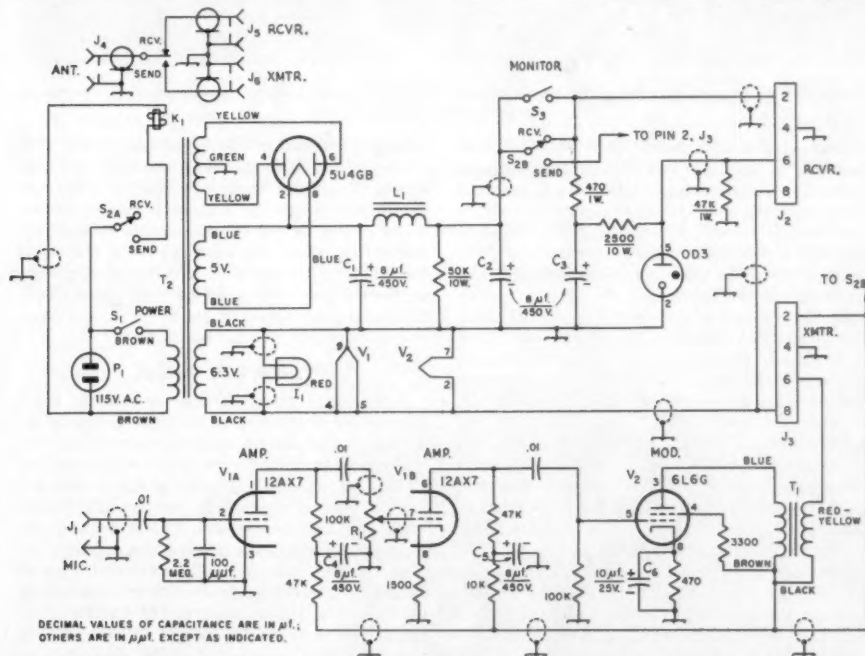
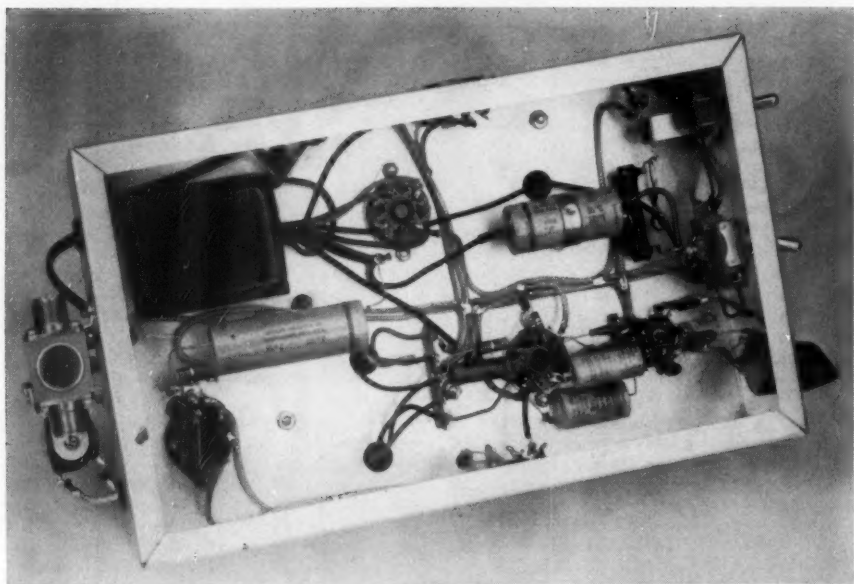


Fig. 5—Schematic diagram and parts information for the modulator and power supply. Capacitor values in $\mu\text{f.}$ unless otherwise indicated. Resistors $\frac{1}{2}$ watt unless specified.

- C1—C5 incl.—8 $\mu\text{f.}$ 450-volt electrolytic. C1, C2 and C3 can be separate or combined in one housing.
- C6—10 $\mu\text{f.}$ 25-volt electrolytic.
- L1—Pilot lamp and socket.
- J1—Microphone connector (Amphenol 75-PC1M).
- J2, J3—Octal socket (Amphenol 77-MIP-8).
- J4, J5, J6—Coaxial fittings on relay K1.
- K1—Coaxial antenna change-over relay, 115 volts a.c.
- L1—4.5-hy. 200-ma. filter choke (Stancor C-1411).

- P1—115-volt plug.
- R1—0.5-megohm control, audio taper.
- S1, S3—Toggle switch, s.p.s.t.
- S2—Toggle switch, d.p.d.t.
- T1—20-watt modulation transformer, pri. 10,000 ohms, sec. 3, 5, and 8000 ohms (Triad M3X).
- T2—Power transformer, 270-0-270 volts, 200 ma.; 5 v., 3 amp.; 6.3 v., 4 amp. or more (Stancor P-8172).



Bottom view of the modulator and power-supply assembly. Note the coaxial antenna changeover relay mounted on the rear wall of the chassis.

testing of the equipment, only the dual 8- μ f. capacitor at the upper right having been included originally. A triple 8- μ f. 450-volt capacitor or three separate 8- μ f. 450-volt capacitors can be used equally as well. The modulator and speech-amplifier components are at the lower right of the bottom view. The main control switch and pilot socket are in the upper right.

In the schematic diagram, Fig. 5, the main control switch is shown in the *off* position. When it is closed, the power circuits are activated, applying filament and plate voltage to the rectifier, and heater voltage to the modulator and to whatever equipment is plugged into it. The send-receive switch, S_2 , is shown in the *receive* position, which is the way it should be left when the station is turned off. With the power on, 150 volts, regulated, is applied to the amplifier and detector tubes in the tuner and to all tubes in the converters, through Pin 6 of socket J_2 . The audio stage in the tuner receives its high-voltage d.c. through Pin 2 of J_2 . When S_2 is in the *send* position, a.c. goes to the coil of the coaxial relay, K_1 , and high-voltage d.c. to the transmitter through Pin 2 of socket J_3 , and to the speech amplifier and modulator tubes.

Note that the plate current of the transmitter output stage flows through the secondary of the modulation transformer, T_1 . The fluctuating audio voltage from the modulator, also in this secondary winding, adds to and subtracts from the d.c. voltage that reaches the amplifier plate through Pin 6 of J_3 . This, in simple terms, is the modulation process: making the transmitter amplifier plate voltage vary in relation to the audio

voltage developed in the speech amplifier.

The switch S_2 is shown in the open position, which allows the receiver to go off when the transmitter comes on. Closing S_2 keeps the receiver operating during transmitting periods, for monitoring or duplex work. In using the outfit this way you will probably have to use earphones on the receiver to prevent audio feedback. Keep the audio gain control on the tuner turned down low, or your ears will take a beating.

The S.W.R. Bridge

Just about every article describing v.h.f. transmitter or antenna adjustment mentions the advisability of using a standing-wave bridge, yet many bridges do not work satisfactorily even on 50 Mc., let alone 144. The bridge shown here is a v.h.f. version of the popular Monimatch. It will work on lower frequencies, but it is primarily intended for v.h.f. use. The pickup at lower frequencies may not be sufficient for low-power operation. The bridge can be left permanently in the line from the antenna to the coaxial relay, and it will show relative power output (forward power) as well as reflected power, depending on the switch position, at levels up to 100 watts or so. The absorbed power is a negligible portion of the transmitter output.

The meter is a 1½-inch square plastic-face 1-ma. job (Lafayette TM-400). Connected as shown in Fig. 6, it not only serves as an indicator for the bridge, but it also may be used for measuring plate and grid current in the transmitters. This application was covered in detail in Part II of this series. Resistor shunts are built into the

transmitters, so that when the meter with its 1000-ohm resistor in series is plugged into the proper tip jacks the meter reads 10 ma. full scale for grid current measurements and 100 ma. for plate current.

The meter reading when the bridge is in the antenna line indicates relative power only. The sensitivity control, R_1 , permits use of the bridge at power levels from 1 to 100 watts. It should always be turned down before the meter is used at an unknown power level. The control is then advanced to give a reading that is convenient for the adjustment purpose at hand. In tuning up for maximum power output you may want to set the meter at about half scale, to allow room for improvement. If tuning is completed and you are checking antenna matching, the forward reading should be as near full scale as possible, for maximum sensitivity in the reflected-power position.

The bridge is built in a $2 \times 4 \times 6$ -inch aluminum chassis. The input and output coaxial fittings are mounted in the exact centers of the long sides of the chassis. The two button bypass capacitors are $1\frac{1}{4}$ inches apart, also on the center line of the chassis. Placement of the other components is not critical.

To make the line for the bridge, cut a piece of RG-58/U coax $7\frac{1}{4}$ inches long, and remove the black covering. Push the braid from the ends toward the center, so that it becomes loose over the inner insulation. At the exact mid-point of the braid, part the strands sufficiently to pass a No. 24 enameled wire. This should be about 10 inches long, preferably Formvar insulated. Clean the insulation from it for about $\frac{1}{2}$ inch at the center, and twist this portion into a small loop. This will be the connection point for the 47-ohm

resistor. Now feed the ends into the space in the braid, and bring them out through the opposite ends, pulling them through the braid at about $\frac{1}{2}$ inch from each end. Solder the ends of the inner conductor of the coax to two coaxial fittings. Slide the braid back to its original position and solder the braid ends to grounding lugs at each fitting.

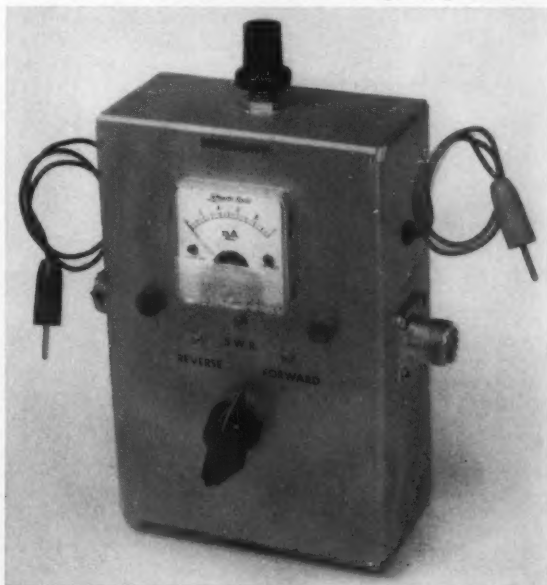
Solder the 1N34 diodes to the outside switch terminals, leaving connections no more than about $\frac{1}{4}$ inch long. If you have the newer type diode, which is glass-enclosed and color-coded, the end with the black ring should go toward the switch. The other ends of the diodes connect to the ends of the wire that is threaded inside the braid. Make these connections short and direct, and be sure that the exposed leads are the same length on each side. The coax is draped in U shape, so that it just touches the inner end surface of the chassis. At this point the 47-ohm resistor is connected from the enameled-wire tap to a ground lug fastened at the center of the end wall of the chassis.

Placement of the other components is not critical. The sensitivity control, R_1 , is mounted in the top end of the chassis, and the meter hole is centered below it, $1\frac{1}{2}$ inches down from the top edge of the main chassis surface. The two tip jacks are $\frac{3}{4}$ inch in from the edges of the chassis and $2\frac{1}{2}$ inches down from the top. The switch is 2 inches up from the bottom.

Uses

The primary purpose of the bridge is to determine when the antenna system is properly matched to its feedline, but it also serves other ends. When in the forward-power position, the

The standing-wave bridge is a v.h.f. version of the Monimatch, commonly used on lower bands. Test leads permit the bridge meter to be used for measuring grid and plate currents in the transmitters.



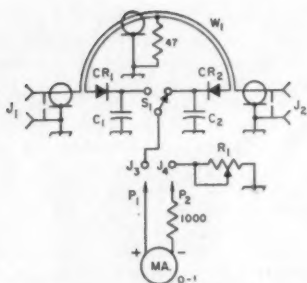


Fig. 6—Schematic diagram of the standing-wave bridge.
Fixed resistors are 1/2 watt.

C₁, C₂—0.001- μ f. button-style capacitor (Centralab ZA102).

CR₁, CR₂—1N34 diode.

J₁, J₂—Coaxial receptacle, 50-239.

J₃, J₄—Insulated tip jack.

P₁, P₂—Insulated tip plug.

R₁—5000-ohm control.

S₁—S.p.d.t. rotary switch (Centralab 1460).

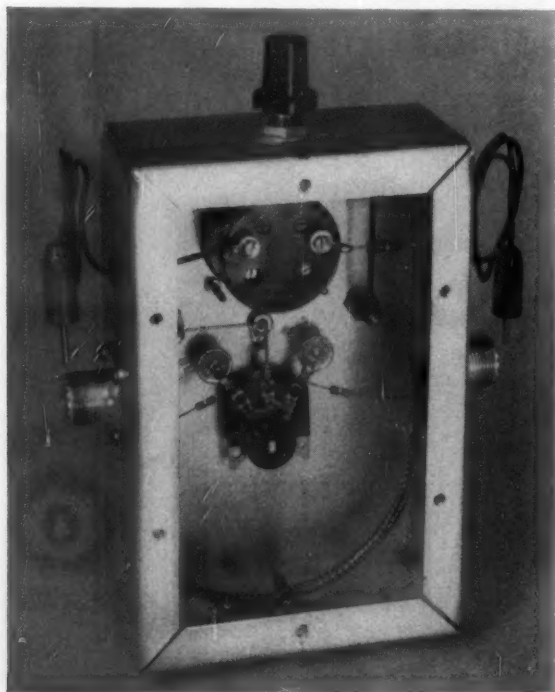
W₁—7 1/4-inch length of RG-58/U, with No. 24 enameled wire inserted as per text. Use Formvar-insulated wire if possible.

meter gives a sensitive indication of the amount of power going through the transmission line, so it is useful in tuning up the transmitter. In fact, once the transmitter is operating according to the information given in Part II, tuning can be done merely by watching the bridge meter while ad-

justing the final amplifier plate and loading capacitors for maximum indication.

The bridge should be connected between the antenna relay and the line to the antenna, as shown in Fig. 1, Part I. V.h.f. antennas are usually designed to be fed with 50-ohm coaxial line, or 300-ohm balanced line. Various means for making the antenna present a 50-ohm load are beyond the scope of this series, but whatever the matching system is, it can be adjusted by setting the bridge switch in the reflected-power position and adjusting for minimum indication. Switch to the forward-power position intermittently and check the transmitter adjustments to see that they have not been thrown off by the change in load impedance occurring during antenna work.

If the antenna is fed with a balanced line, some form of balanced-to-unbalanced coupling system will be needed. Here, again, a detailed discussion of such devices is not attempted here, but the reader is referred to the *ARRL Handbook* and *Antenna Book* for more information. If the line is a 200-ohm type (rarely used), or the antenna presents a 200-ohm balanced load, a coaxial balun can be inserted at the point where it is desired to change from 50-ohm coax to 200-ohm balanced load or line. Information on the construction of a coaxial balun can be found in either of the above references. If the load is other than 200 ohms, the best means of matching between 50-ohm coax and any value of balanced load is an antenna coupler. This is a simple tuned



Interior view of the bridge. Symmetry and minimum length of r.f. leads are important in making this type of bridge work at 50 and 144 Mc.

circuit with a tuned link coupled to it. Again, the *Handbook* will give all necessary information. An advantage of the tuned antenna coupler is that it provides considerable rejection of unwanted frequencies that might cause interference to television and other services.

It should be emphasized that an antenna coupler or antenna matching device should always be adjusted for minimum reflected power in the coaxial line. This should be zero or very close to it. The bridge is then switched to the forward-power position and the transmitter and loading adjustments are checked to be sure that the rig is delivering maximum power to the line. Adjustments to the transmitter have no effect on the standing-wave ratio on the transmission line. If the transmission line is long (over 50 feet or so) the bridge will give the most sensitive indication of matching adjustment if it is connected at or near the antenna. Where it is connected in the line will have no bearing on its effectiveness as a forward-power indicator.

The test leads must be plugged into the bridge tip jacks in order to read either forward or reflected power. These leads can be any convenient length, as they carry only a very small direct current. The bridge may be left connected in the antenna line while the meter is used for transmitter measurements, as removing the leads from the bridge tip jacks disconnects the meter from the bridge circuitry.

Checking Modulation

Some kind of lamp load is helpful in observing the effects of modulation on the transmitters. Connect a crystal or high-impedance dynamic microphone to the modulator, and with the audio gain turned down, adjust the transmitter for maximum output indication as described on pages 33 and 34 of August *QST*. If the lamp load

is made of several blue-bead pilot lamps connected in parallel, the bridge can also be used as an auxiliary indication of power output. If the load is a 115-volt lamp the mismatch may be too high to use the bridge effectively.

Advance the audio gain slowly while speaking into the microphone. As the gain is increased it will be seen that the brilliance of the lamp indication increases with speech. There should be appreciable brightening, but the plate and grid currents should not vary. Adjustment of the grid drive and the loading affect the ability of the transmitter to modulate properly. If the grid current is too high or too low, modulation may cause the currents to fluctuate, indicating that the voice quality will suffer and the transmitter may cause interference outside its normal pass-band. Most effective modulation will be obtained at the highest gain setting that can be used without causing the plate or grid current to fluctuate.

It is possible that the modulation may be low, even if the transmitter is working properly, due to limited output from the modulator. The modulator will deliver 7 to 8 watts of audio without severe distortion. This means that the transmitter should not run much over 15 watts input if full modulation is to be achieved. If you get reports of "low modulation" from fellows you work, reduce the transmitter input slightly by detuning the loading capacitor and readjusting the plate tuning for the point that gives the greatest output with the least plate current. A current of 60 to 70 ma. will be about all that the modulator will handle well, though on c.w. it will be possible to increase the loading to the point where the final stage runs 20 watts input or more. This is worth having, though the difference between it and the 15 watts that can be fully modulated will be just barely noticeable at the receiving end.

QST

OUR COVER

Reports, logs, and photos are flooding the mails to 38 LaSalle Road as a result of the activity on the annual Field Day of 1961. Our cover this month shows some of the typical scenes, and in a later issue we'll have more photos and info.

On the cover, at the left top, we see the power supply used by VE2AXO/2. Just below that, c.w. operators W8EZE and K8JIX keep at it while W8TBZ rests for a moment. At the lower left W0WIZ pours himself a cup of coffee, while to his right above W7JSY demonstrates a novel method of log-keeping. Bottom center is the setup at W3CDI/3. At the top right K6ARK and WA6BVO get an antenna lined up. Singing in the rain, center right, are K2TQJ, WA2JZE, K2SJM, and K2ZDJ. And finally, bottom right, we see WA6CNS on top of Mt. St. Helena.

Strays

K5RAB (Dan Monaghan, 112 S. Ninth St., P.O. Box 609, Garland, Texas) wants to hear from hams who are optometrists.

Two errors in the April, 1961 *QST* article describing a homebuilt parabolic reflector for 1296 Mc. have been pointed out by alert readers.

From K8IVJ: "The angle of the supporting member of the drive is given as the colatitude. A little reflection will show that the north star is elevated from the horizon by the latitude, and depressed from the zenith by the colatitude. It then follows that the angle of this supporting member and the vertical post is equal to the latitude. The angle of the drive and the post is the colatitude."

From WA2FGY: "Having just finished working with parabolas in school, I feel that I must correct the formula given for a parabolic curve in April *QST*, page 11. The way I learned it, the formula should be $Y^2 = 4px$, not $Y^2 = 2px$ as stated in the article."

• Beginner and Novice



The switch at the left front of the chassis is S_1 . In the center are three octal power take-off sockets. The control adjacent to the sockets is R_1 and R_2 is at the right. Along the top front of the chassis is the five-terminal 6.3-volt strip, the NE 51 which is mounted in a rubber grommet, and J_1 and J_2 , tip jacks. The two empty sockets at upper right corner are for VR tubes as explained in the text.

A Utility Power Supply Made From An Old TV Set

BY LEWIS G. McCOY,* WHCF

ANY amateur interested in building his own gear will find that a very handy item to have in his station is a utility power supply. In many instances a ham is reluctant to build station accessories such as converters, monitors, and so forth because a good part of the cost in such units is in the power supply. The supply to be described here has enough power capabilities to handle all the accessories that even the most ambitious builder could dream up. In addition, the cost of the supply is so low that surely any reader can afford it. Recent articles¹ have shown the appeal of using old TV chassis for a ready-made junk box and that is the basis for the supply to be described.

* Technical Assistant, QST.

¹ Haywood, "The Spare-Parts Plutocrat," QST, July, 1961.

Circuit Features

The circuit diagram for the utility supply is shown in Fig. 1. Basically, the circuit consists of full-wave rectifier, V_L , into a capacitor-input filter circuit. The filter circuit is made up of C_L , L_1 , and C_2 . With most TV transformers the d.c. output voltage will be between 300 and 400 volts at full-load current. The average TV transformer should handle about 250 ma. current drain in continuous service without overloading.

With the transformer used in this supply the a.c. high voltage measures 330 volts each side of the center tap. The no-load d.c. voltage out of filter is slightly more than 400 volts. Under a load of 50 ma. the voltage drops to 380, and is down to 290 volts at a load of 250 ma. Other transformers with different ratings will of course give correspondingly different outputs, but these

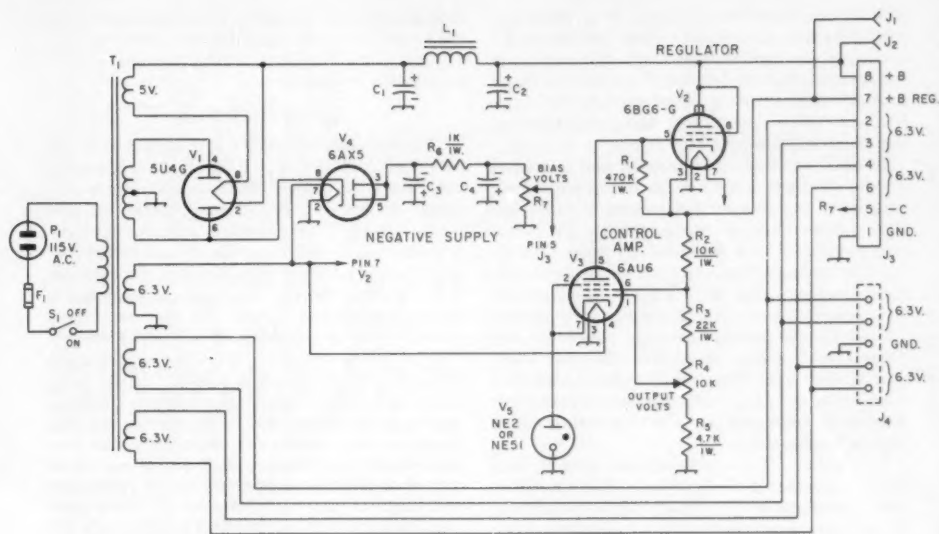


Fig. 1—Circuit diagram of the utility power supply. All resistances are in ohms, resistors are one watt.

C₁, C₂—10 or more μ f., 450-volt electrolytic, see text.

C₃, C₄—20- μ f., 450-volt electrolytic.

F₁—3-amp. fuse.

J₁, J₂—Tip jacks.

J₃—Octal tube socket.

J₄—5-terminal binding post strip (Millen 37305).

L₁—Approx. 2 hy., taken from TV set.

P₁—A.C. line plug.

R₁—10,000-ohm control.

R₂—1 megohm control.

S₁—Single-pole, single-throw toggle switch.

T₁—Power transformer taken from TV set, see text.

figures are typical of what you may expect from a TV power transformer.

Taking off from the output of the filter network is a regulating circuit that will provide a regulated voltage that can be set anywhere from 235 volts down to 90 volts. The amount of current that can be drawn at the different voltages is shown and explained in Fig. 2.

The tubes used in the regulator circuit, V₂ and V₃, are a 6BG6G and a 6AU6 respectively. These were taken from the old TV chassis and served the purpose adequately. The 6BG6G is connected in series with the load circuit and acts as a voltage regulator. The 6AU6 serves as the control tube; its plate current flows through R₁, and the voltage drop across this resistor is used to bias the regulator tube, V₂, which acts as an automatically variable resistor in series with the load. The plate current of V₃ is controlled by R₄, which is used to adjust the bias on the control tube. If this bias is changed, there is a corresponding change in the current flow through the control tube. This in turn changes the voltage drop across R₁, thus controlling the bias on the regulator tube. When the bias on V₂ becomes more negative, the plate-to-cathode resistance of the tube increases, thereby lowering the output voltage. When the bias on the regulator tube goes in the opposite direction the plate-cathode resistance is decreased and a higher output voltage is obtained. Good regulating action requires a constant-voltage bias source for the control

tube. This is provided by V₅, a neon bulb, which establishes a "reference" voltage for the cathode of V₃.

In an unregulated supply an increase in load (heavier current drain) will cause the voltage to drop. With this system of electronic regulation

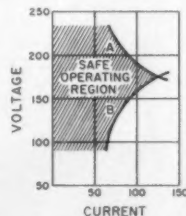


Fig. 2—This graph shows the maximum current that can be drawn in the regulated range, at voltages from 90 to 235, using the circuit of Fig. 1. Curve A shows the maximum amount current at which regulation will be maintained. Curve B shows the current, at any given voltage, at which the plate dissipation of the 6BG6G regulator tube is just at the tube rating. Operation should be confined to the region to the left of both curves. For example, at 150 volts you could take as much as 150 ma. at constant voltage, but this would be well over the safe rating of the regulator tube. To stay within the tube limits the maximum safe current would be 75 ma., as shown by curve B. These curves apply only to the circuit and components shown in Fig. 1, although they will be fairly typical of regulated supplies constructed of other components of the same approximate ratings.

any change in output voltage, from whatever cause, changes the effective plate-to-cathode resistance of the regulator tube in such a way as to compensate, thus to holding the output voltage constant. The regulated voltage out of V_2 can be held quite accurately over the voltage/current range shown in Fig. 2.

In addition to the unregulated and regulated positive voltages available from the supply an adjustable negative voltage source is provided. This consists of a half-wave rectifier, V_4 , into a capacitor-input type filter and a voltage divider, R_7 . The voltage range is from 0 to about 400 volts negative, the higher limit depending on how heavily the positive supplies are loaded. This type of negative voltage source is not capable of handling more than one-half milliamperes of current. However, it is useful whenever a negative voltage at low current requirements is needed, as in grid-block keying and in many biasing applications.

To provide for flexibility an extra pair of octal sockets is mounted on the chassis. These could be used, for example, for voltage regulator tubes of the gas type if a fixed regulated voltage is needed.

In the unit shown in the photographs there are several different power take-off connections. Two separate 6.3-volt a.c. sources (these can be connected in series to provide 12.6 volts), +B regulated, and negative voltage, are available through paralleled octal sockets. The builder can install as many sockets as he thinks he'll need — just connect all the same-numbered pins together. Three are used here. In addition, there are two tip jacks which can be used for the regulated and

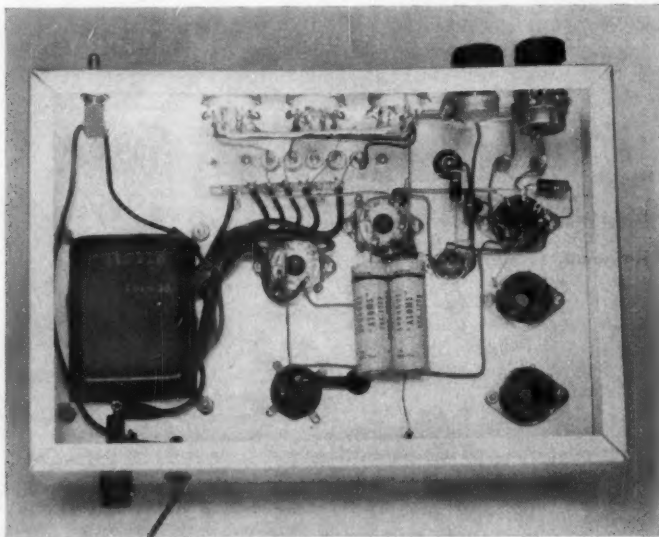
unregulated +B voltages. A five-terminal strip mounted on top of the chassis is used for two 6.3-volt take-offs; the remaining terminal can be used as the builder desires.

Getting the Parts

The best source of old TV sets is your local TV repairman or dealer. You'll find that he is usually very happy to unload the chassis at prices of a couple dollars each or, in some instances, just for the asking. If the chassis you get doesn't have any tubes in it you can probably get used tubes for the supply from the same source, for pennies. When getting the old set, make sure it has a power transformer — some of the sets used selenium rectifiers in transformerless supplies.

In stripping the parts from the set keep all component leads as long as possible. If you have a voltmeter you can check the different windings on the power transformer. The primary winding leads on the transformer are usually the two black leads. If you are in doubt, or if you don't own or can't borrow a multirange a.c. voltmeter, you might be able to impose on the TV repairman's good nature and get him to check out the transformer for you. The two controls, R_4 and R_7 , can be found in most sets, along with the electrolytic capacitors and resistors needed.

In nearly all TV transformers one of the 6.3-volt filament windings is designed to carry much more current than the other windings. This winding can be determined by the size of the conductor or conductors if the leads are stranded — the larger the wire, the heavier the current rating of that winding. Our transformer



This bottom view shows the arrangement of the components below deck. At the upper right-hand corner is R_7 , the negative voltage control. This particular unit also has a single pole switch mounted on the control and we had planned to use it in place of S_1 . However, the switch was faulty (probably one of the reasons the TV set was junked!). The two electrolytic capacitors near the lower center are C_3 and C_1 . Just to their left is the base of the canned electrolytic, C_1 and C_2 .

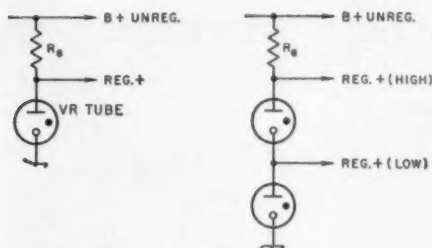


Fig. 3—Circuit showing method of connecting VR tubes to the utility power supply.

R_8 is determined from the formula $R = \frac{1000 (E_s - E_t)}{I}$

where R is the limiting resistance in ohms, E_s is the voltage of the source across which the tube and resistor are connected, E_t is the rated voltage drop across the VR tube, and I is the maximum rated current of the VR tube in milliamperes (usually 40 ma.) For two VR tubes in series E_t is the sum of the voltage drops across the two tubes. In the case of two tubes in series the upper tube must carry more current than the lower if a load is connected to the low tap. The total current drawn from both high and low taps should not exceed 30 to 35 ma.

had three separate 6.3-volt windings, as can be seen in Fig. 1. Some of the transformers used in TV sets have only two such windings. In that event use the lighter of the two windings for the tubes in the supply and the heavier winding for your connections to J_3 and J_4 .

Construction Information

The complete supply is mounted on a $3 \times 8 \times 12$ -inch aluminum chassis. Component arrangement is not at all critical, but it is a good idea to mount the S_1 , R_4 , and R_7 on the front of the

chassis for easy access. The TV set we used had a fuse and holder, so this was mounted on the rear of the chassis where the a.c. line comes in. You don't have to fuse the supply but it is certainly worth the trouble and expense to protect the transformer and tubes.

Be sure to observe the correct polarity when mounting the electrolytic capacitors. In the power supply shown, C_1 - C_2 is a dual unit, metal cased, taken from the TV set. You'll find data on the side of the can of capacitors of this type showing capacitance and voltage rating. In nearly all instances the metal case is negative and the terminals are positive. In the event that the capacitors you scrounge from your TV set do not have the same values as those given in Fig. 1, don't worry about it. The values are not critical and whatever capacitors were used in the TV set will provide adequate filtering for your supply. If the electrolytic you use from the set is dual type use the lower value capacitance for the input side of the filter (C_1).

If you want to use a gas VR tube for a fixed regulated voltage you'll need a current-limiting resistor in series with the tube. Fig. 3 shows the method of connecting the VR tube in the supply. Also shown is the way two tubes can be connected in series to provide two different regulated voltages.

Keep in mind that any voltage can be dangerous, and all terminals should be protected so that any danger of accidental contact with an exposed terminal is minimized.

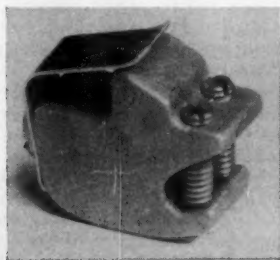
Make a permanent record of the output terminal connections and keep it with the supply. Nothing can be so exasperating as to have to check through the circuit to find out which terminal has what voltage every time you use the supply.

QST

• New Apparatus

Mosley Whip-Klip

THE model MWK Whip-Klip shown in the photograph is a device for holding down a mobile whip antenna to the car's rain gutter. The fitting is an aluminum casting with a spring clip and two screwdriver-slot set screws. It is attached



to the rain gutter and held with the two screws. The mobile whip antenna is bent over and placed in the spring clip holder. It is only necessary to give the antenna a "down-and-out" pull to release it — something that can probably be done by reaching from inside the car. The Whip-Klip is manufactured by the Mosley Electronics, Inc., Bridgeton, Missouri.

— E. L. C.

Strays

Work 10 members of the York Road Radio Club, Elkins, Pa., and receive their certificate. All QSOs must have been after Feb. 7, 1961, and on 10, 6, or 2 meters. Send list of QSOs to Robert Bettinson, W3ZY0, 4629 N. Rosehill St., Philadelphia 20, Pa.



The Big Wheel on Two

Improved Omnidirection Coverage on 144 Mc. with Horizontal Polarization

BY ROBERT H. MELLEN,* W1IJD and CARL T. MILNER,* W1FVY

FOR the two-meter buff, here is a new omnidirectional cloverleaf antenna with horizontal polarization. Large size results in improved bandwidth and coverage over the popular halo, and gives superior anti-flutter properties in mobile operation. Singly or stacked, the Big Wheel is also a boon for local work from the home station.

Anyone who has been involved in local two-meter net operation knows that there are many times when the directivity of a beam antenna is a handicap, and some of its gain could be profitably sacrificed for good omnidirectional coverage. For the mobileer, an omnidirectional radiation pattern is a must. For him, there is only the choice of sticking with the vertical whip or, if he wishes to avoid cross polarization with the rest of the fraternity, graduating to the halo or turnstile. In any event, there is a good case for the hori-

zontally polarized omnidirectional antenna on two meters. The question is only what type best serves the purpose.

Halos and turnstiles are surely steps in the right direction. The halo, particularly, has one marked disadvantage. It satisfies the polarization requirement and has a fairly good pattern, but it suffers from small "capture area." This means less bandwidth and gain, and worse mobile flutter characteristics than are possible with antennas of larger size. The turnstile is somewhat better, but it is still a small antenna.

To study possible advantages of large size, we started experimenting with the old three-half-waves-in-phase type. This is a simple arrangement of three horizontal dipoles in a circle, fed in phase at the center, as shown in Fig. 1A. Illustrations of this antenna are found in the literature but design details are lacking. This turns out to be a problem since, due to mutual coupling, both impedance and resonant frequency depend on the geometry. Thus the usual dipole formulas do not apply. Results of early tests of crude

* U. S. Navy Underwater Sound Laboratory, New London, Conn.

The authors are currently on a research assignment in the Arctic. Correspondence regarding the article should be sent to ARRL Headquarters.

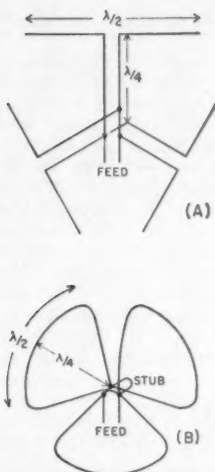


Fig. 1—Development of the "Big Wheel" started with three half waves in phase, as shown at A. Despite poor matching initially, this configuration showed promise and evolved into the cloverleaf style at B. Each element of the cloverleaf is one wavelength long. Feed impedance is brought to 50 ohms through the use of a tuning stub.

models of this antenna showed great promise, particularly for mobile use, despite poor matching.

The design shown here evolved not so much from trying to improve the matching properties, but simply to try something new. Instead of using the center-connected transmission line, we decided to support the elements by feeders at each end instead of at the center, as shown at B in Fig. 1. This proved to be a fortunate choice, as it resulted in simpler construction, better mechanical stability, and more easily adjustable electrical properties. Now, each element is a full-wave loop, and it can be bent to try out various shapes and diameters. The idea is the same as before, however. The half-wave portions of the loop at the rim serve as radiators, while the radial portions at each end serve as quarter-wave feeders. Don't try to figure out where one ends and the other begins!

In designing this antenna, the first step was to settle on the shape of the elements. Various configurations were tried ranging from the most compact arrangement, a wheel consisting of three pie-shaped elements with an over-all diameter of about three feet, to a huge cloverleaf with oval-shaped elements and an over-all diameter of almost five feet. As a result of these experiments, we found that compactness makes matching and current equalization troublesome. Curiously, the radiation pattern is only slightly affected by the shape. For each of the elements there always remains a slight "front-to-back" ratio, roughly 3 db. Variations in the pattern of this amount are barely noticeable in ordinary use. This observed pattern is shown in Fig. 2.

The next step was to trim the elements to length and adjust the stub for best s.w.r. at

the desired frequency. Since all elements are fed in parallel at the low-impedance point, the input impedance would normally be quite low. Each has a radiation resistance of about 30 ohms in this configuration, which would give only 10 ohms for the parallel combination. To match to a 50-ohm line, the conventional stub-tuner scheme was used. Element lengths are chosen so that the impedance is capacitive and the circuit is then tuned to resonance with an inductive stub to give an input impedance of 50 ohms at the center frequency.

The design described here has an over-all diameter of four feet. It is no more critical or difficult to build than a three-element beam. Elements are made of 3/8-inch o.d. corrosion-resistant aluminum tube (Alcoa Type 6061-T6). The lengths are bent cold to the shape shown in Fig. 3. For good performance over the band, 80-inch lengths are used. The bracket and remaining hardware are prepared according to Fig. 3, and the elements mounted. Wood dowels are used to plug the element ends to provide strength and seal against moisture. The tuning stub is then cut to 5-inch over-all length, bent to shape and mounted as shown. Finally, the transmission line is prepared and connected. Keep the leads short or the s.w.r. will suffer. After assembly the structure is checked for conformity to dimensions and is ready to go.

As shown in Fig. 2, the s.w.r. should be 1.2 or better over the band. The pattern should be uniform to within ± 2 db.

Stacking the Big Wheel

Two of these antennas can be stacked for the home station with an increased array gain of about 4 db. To improve the radiation pattern,

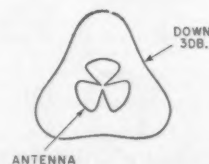
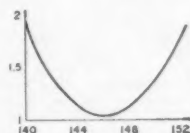


Fig. 2—Performance of the cloverleaf array. Frequency response can be controlled over a wide range, depending on the shape of the elements and over-all size. The configuration described is usable over the entire band if centered near 146 Mc.

There is a slight dip in the radiation pattern in back of each notch in the cloverleaf, but this is hardly noticeable in ordinary operation. In mobile work it is insignificant.

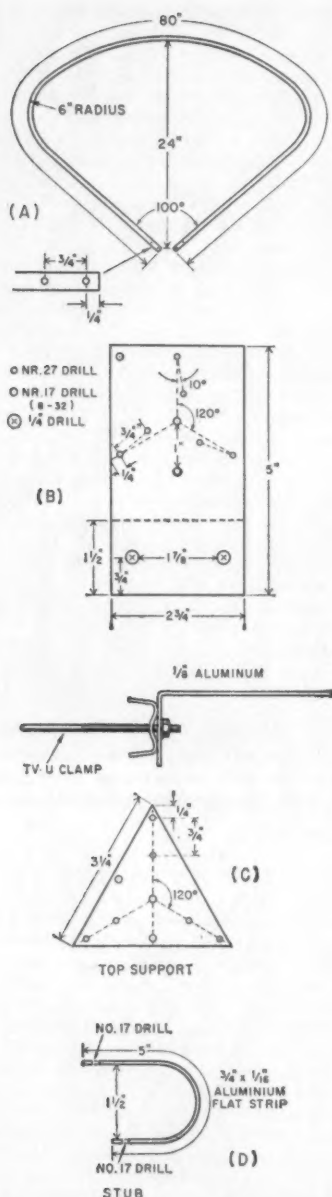


Fig. 3—Structural details of the Big Wheel 2-meter array. One element is shown at A. A wood dowel 2 inches long is driven into each element end to add strength.

The grounded lower support is shown at B. It is bent down at a right angle to permit mounting to a vertical pipe with a TV-type U clamp. The triangular top support is shown at C, and the tuning stub at D. The array is fed with 50-ohm coax, the inner conductor of which is connected to the upper support. Brass screws (3/4-inch 6-32) are used to assemble the parts.

the stacked antennas can be staggered by 60 degrees.

Stacking increases the directivity only in the vertical plane, while horizontal polarization and the omnidirectional pattern of the single antenna are preserved. This type of array is widely used in f.m., TV and beacon applications, where such properties are required. With the broad bandwidth and uncritical behavior of the Big Wheel, it is not difficult to realize considerable stacking gain by adding more bays before reaching the point of diminishing returns. In fact, results can be achieved in all directions which compare favorably with a small beam in its best direction.

Gain of a stacked array depends on both the number of bays and the spacing between them. In these experiments the optimum spacing of $\frac{5}{8}$ wavelength was used. Two-bay arrays were tested, showing a gain over a dipole roughly equivalent to a 2-element Yagi, but in all directions. It appears that 4, 6 or even 8 bays might be used,¹



The 2-meter Big Wheel for mobile or fixed-station use.

but the point of diminishing returns is rapidly reached, as the number of bays must be doubled for substantial gain and the length of mast required becomes a problem.

With a bay spacing of $\frac{5}{8}$ wavelength it is convenient to use full-wavelength phasing lines of coax. At 146 Mc. $\frac{5}{8}$ wavelength is approximately 50 inches, while for coaxial line a full wavelength is about 53 inches, due to the propagation factor of the line. The length of the coax is important, as both matching and phasing depend on it. The spacing is nominal, however, and it can be adjusted to make the phasing sections fit properly.

The arrangement for a two-bay antenna is

¹ Extensive tests of the Big Wheel have been made by the editor, both at the home station and in the field. The single-bay clover-leaf array has given performance superior to any other single omnidirectional antenna yet tried, and the two-bay system is all that the authors claim. In portable work, particularly, it has been found that a two-bay Big Wheel brings in signals with a strength comparable to that achieved with small Yagis, yet it delivers this performance in all directions and over a wider frequency range than is obtainable with parasitic arrays. Tests are currently underway with a four-bay system and results will be reported at a later date.

—W1HDQ

shown in Fig. 4. A full wavelength of RG-11/U 75-ohm coax is used for the phasing section. It is driven by 50-ohm RG-8/U transmission line at a point $\frac{1}{4}$ wavelength up from the bottom, to achieve proper impedance transformation. The two ends of the coax are out of phase, so one of the bays must be turned upside down to put the antenna currents in phase.

When the original 5-inch stubs were used, it was found that the point of minimum s.w.r. had shifted from 146 to 148 Mc., due to coupling between the bays. This was corrected by increasing the stub length from 5 to 6 inches total length. The resulting s.w.r. curve is almost identical to that of a single antenna. With the bays staggered 60 degrees on the mast the pattern variations are negligible. Gain is approximately 4 db. over a dipole.

For both mobile and fixed station, the Big Wheel has performed beyond our fondest hopes. Mobile results are particularly astonishing, as the troublesome rapid flutter is remarkably

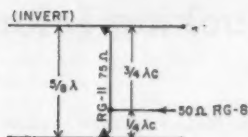


Fig. 4—Stacking method for two Big Wheel antennas. Because of the propagation factor of coaxial line, an electrical full wavelength of coax, λ_c , is approximately $\frac{1}{2}$ wavelength long. This is the optimum stacking dimension for dipoles. By using a 75-ohm phasing line the system may be fed at the point indicated with a 50-ohm transmission line. Note that one bay must be inverted to keep antenna currents in phase.

reduced. Our best testimonial was the occasion when one operator said he couldn't believe that such a strong, steady signal was coming from a moving car at such a great distance. At home it's a pleasure to be able to hear everyone in the Shoreline Net without continually fussing with a rotator.

QST

Don't Miss This Sept. 16-17 V.H.F. Activity

September V.H.F. QSO Party

CQ CONTEST" on the v.h.f. bands the week end of September 16-17 will mark another popular ARRL V.H.F. QSO Party. This contest which gets under way at 2 p.m. (1400) your local standard (not daylight) time Saturday, September 16, and runs through 10 p.m. Sunday, September 17, is open to all amateurs in the 72 ARRL sections who can work 50 Mc. or above. For purposes of the contest Yukon-N.W.T. (VE8) will count as a separate section.

Just exchange ARRL section (see page 6, this QST) and count one point for completed exchanges on either 50 or 144 Mc.; two points for contacts on 220 or 420 Mc.; and three points for contacts on higher bands. The sum of these points multiplied by the number of different ARRL Sections worked per band gives your final score. Therefore, it pays to contact the same stations on different bands to increase both contact points and multiplier.

A certificate goes to the highest single-op scorer in each section, as well as a certificate to the highest scoring Novice and multiple-operator station in each section from which at least three entries in that special category are submitted.

Send to ARRL Communications Dept., 38 LaSalle Road, West Hartford 7, Conn., for free log forms as shown on page 64 of June, 1960, QST. Please, either follow that log format, or send for the log forms. Reports should include your call and ARRL section, as well as times, calls, and sections of stations worked. To report the results in December QST (so you'll know how you did before the V.H.F. SS starts), we must have the logs in before the deadline. Logs must be post-marked by October 7. Good luck!

Rules

1) The contest starts at 2:00 p.m. Local Standard Time, Saturday, Sept. 16, and ends at 10:00 p.m. Local Standard Time, Sunday, Sept. 17. All claimed contacts must fall within this period and must be on authorized amateur frequencies above 50 Mc., using permitted modes of operation.

2) Name-of-section exchanges must be acknowledged by both operators before either may claim contact point(s). A one-way exchange, confirmed, does not count; there is no fractional breakdown of the 1-, 2-, or 3-point units.

3) Fixed-, portable- or mobile-station operation under one call, from one location only, is permitted. A transmitter used to contact one or more stations may not be used subsequently under more than one other call during the contest.

4) Scoring: 1 point for completed two-way section exchanges on 50 or 144 Mc.; 2 points for such exchanges on 220 or 420 Mc.; 3 points for such exchanges on the higher bands. The sum of these points will be multiplied by the number of different ARRL sections worked per band; i.e., those with which at least one point has been earned. Re-working sections on additional bands for extra section credits is permitted. Cross-band work does not count. Contacts with aircraft mobile stations cannot be counted for section multipliers.

5) A contact per band may be counted for each station worked. Example: W1FZJ (E. Mass.) works W1RJA (Conn.) on 50, 144 and 220 Mc. for complete exchanges. This gives W1FZJ 4 points (1 + 1 + 2) and also 3 section-multiplier credits. (If W1FZJ contacts other Connecticut stations on these bands, they do not add to his section multiplier but they do pay off in additional contact points.)

6) Each section multiplier requires completed exchange with at least one station. The same section can provide another multiplier point only when contacted on a new v.h.f. band.

7) Awards: A certificate will be awarded to the high-scoring single-operator station in each ARRL section. In addition, the high-scoring multi-operator station will receive a certificate in each section from which three or more valid multiple-operator entries are received. Certificates will also be given to the top Novice in each section where three or more such licensees submit logs. Award Committee decisions will be final.

8) Reports must be postmarked no later than Oct. 7, 1961, to be eligible for awards. Follow the sample log for correct form, or a message to Headquarters will bring printed blanks for your convenience.

QST

Tracking Information for the OSCAR Satellite

BY RALPH WELLS,* K6QMJ; WILLIAM I. ORR,** W6SAI; M. C. TOWNS, JR.,*** K6LFH

PREVIOUS articles on Project OSCAR have described in a general way some of the requirements to be met in order to hear OSCAR's signal, an outline of the data desired, and the form to use in reporting the data and other observations to the Project OSCAR Association. This article continues the discussion about reception reports, data reduction, and procedures to follow in deriving as much data as possible, as accurately as possible. It is not herein suggested that these are the only, or necessarily the best, ways to track OSCAR. But the methods described have been used, and if you, in your experience, know of better or more accurate ways within the means of the amateur, by all means employ them, and let the OSCAR Association know about it. It is to be noted that *receiving equipment only* is required, allowing any and all to participate. This first series of flights has absolutely no ability to receive and retransmit signals. Any calls made to the space vehicle will do nothing but cause confusing QRM. There are several ways to collect and record tracking information, for the sake of clarity and ease of data reduction and compilation at our end. We request that you use one or more of the sample "formats". The amount of useful data you can gather, of course, will depend upon the refinement of your equipment and the accuracy of your observations.

We anticipate that the majority of reports will originate with amateurs using their own 2-meter equipment, but reports from any and all listeners and observers will be welcome. It is obvious that collecting and recording the data for completing reports using Formats II, III & IV will require more than one person; it is recommended that the number of assistants needed be "signed up" as soon as possible. Remember, too, that OSCAR will pass over or near every spot on the earth approximately four times in each 24 hours. Each pass will provide data of interest to the OSCAR Association, and regardless of your working schedule or operating hours, OSCAR will be in your neighborhood twenty-eight times a week. The same data is needed for as many passes as possible.

General Rules

Regardless of the format chosen, the following general rules apply to all observations:

1. *Time:* GMT (Zulu Time) (Greenwich time) must be employed for all observations. Use of any other time will automatically cause your re-

port to be discarded. (Reference: "World Time Keeping," by Curry, April 1961 *QST*, page 54.) Use any clock or watch with a sweep second hand. Set your clock using WWV, JJJ, CHU or local time source. Plus/minus one second is satisfactory.

2. *Instructions When Using a Beam Antenna:* If you plan to use a directional beam, with a direction indicator:

a. Orient your antenna so that the indicator reads 0° when the beam points toward *TRUE NORTH*. The OSCAR article in July, 1961 *QST* (page 59) describes two ways to accomplish this. Read the bearing in degrees from 0° to 359°, clockwise from *TRUE NORTH*. (East: 90°, South: 180°, etc.). Record the OSCAR bearing reading in column 2 of the report form. (See July *QST*.)

b. If your antenna is also equipped to move up and down in elevation, set the indicator so that it reads 0° when the antenna boom is horizontal, and 90° when the boom is vertical. Record the OSCAR bearing reading in column 3 of the report form.

3. *Location:* To accurately plot the data you supply, the OSCAR data reduction section must know exactly *where* your receiving antenna is located. To do this, they need to know, to the nearest minute, the latitude and longitude of your station. This can be obtained from several sources, but the easiest way is to scale it off a large-scale aeronautical sectional chart, available from your local airport or a pilot friend of yours. In some areas, county clerks can provide the coordinates of your property. Enter these coordinates, to the nearest minute, on the report form in the space provided.

4. *Reports:* All reports must be submitted on a form identical to the one pictured in July *QST*, page 59, following the format you plan to use. A self-addressed, stamped, business-size envelope forwarded to Project OSCAR with a request will bring a supply. Extra copies may be reproduced locally. Use 8½" × 11" paper. Use a separate report form for each OSCAR revolution—located, timed, identified and dated as required. Forward reports to Project OSCAR, P.O. Box 183, Sunnyvale, California.

5. *Accuracy:* Even though your receiving facility (receiver, antenna, etc.) may not be exotic, with care and patience your observations can be quite accurate. However, *do not guess* at information or data if you missed it, or if you are short-handed. Accurate time is available to all with a general coverage short-wave receiver; if your watch does not keep accurate time over a long period, set it just before each pass. Bearings can be accurate, even though the beam width is much

* Special Project Engineer, Philco WDL, Palo Alto, Calif.; ** Amateur Service Department, Eitel-McCullough, Inc., San Carlos, Calif.; *** Lockheed Missile and Space Co., Sunnyvale, Calif.

more than desired. Practice on some weak 2-meter stations; swing the beam back and forth across the signal and note how easy it is to find the bearing of maximum signal strength! Try several times and see how close each bearing is to the last one. Or practice on mobiles in motion; get out an aeronautical chart and track the mobile station. See just how accurate your system is.

6. **Authentication:** To assist in identifying the OSCAR signal, it is requested that the HI-rate be counted at least once during each pass. Watch the sweep-second hand on your clock, and starting with the first dot in any "H", count 10 HIs and stop with the last dot in the 10th "I". Enter the number of seconds elapsed in Column 5 of the report form. The HI-rate is temperature-sensitive, and besides providing the data reduction group with this information, you indicate that you are listening to the OSCAR signal.

All comments regarding any facet of your operation are most welcome, and may be written on the back of the report form. Only through your comments can we improve each succeeding OSCAR package. Your comments will also enable us to clarify any vague points in any part of our total effort. Comments or descriptions of special equipment employed to solve a specific problem

will be entered in our final report to QST, and full credit will be extended.

Let us emphasize again the importance of entering all readings exactly as they are measured, not as you may feel they should be! Remember that we have a unique opportunity to contribute to the world's knowledge of space communications, and both the quantity and quality of each observer's data will be of importance. We here at OSCAR headquarters are gearing up to handle the job of data reduction and analysis. It is interesting to note that if only 1% of the world's hams participate, over 5,000,000 data bits will have to be entered!

Formats

Four formats have been worked out to aid interested observers in the task of collecting and recording the desired data. The formats are identified as Formats I, II, III and IV, and become progressively more elaborate. Each will use the same report form, but only specific columns will be used for reporting data when using the first three formats. Format IV requires data for all columns on the form.

An outline of each format follows:

FORMAT I

Date: In Greenwich time.
Identification: Name, address, call sign of the observer.
Location: Geographical coordinates of receiving antenna to nearest minute.
Equipment Used:
 Antenna: Any 2-meter non-directional or non-rotatable antenna, or better.
 Receiver: 2-meter (145 megacycle), capable of receiving c.w. signals.
 Time: Any clock or watch, with a sweep-second hand, that can be set to correct GMT, plus/minus one second.
Personnel: One or more.
Data Required: Where Entered on Form:
 A. GMT OSCAR first heard Column 1
 B. GMT OSCAR faded out Column 1
 C. Signal strength (db. above noise level) Column 4
 D. HI-rate (number of seconds to count 10 HIs, first dot of "H" to last dot of 10th "I") Column 5

Procedure:
 This format is applicable to those observers who do not necessarily have beam antennas with direction indicators, but who want to participate in the project. Continuous, 24-hour monitoring of OSCAR's frequency will aid in discovering unusual propagation conditions, or phenomena that scheduled listening will not notice. Reports on the reception of OSCAR signals at any time should be reported. If you hear OSCAR when predictions indicate that it should not be heard, you have observed an exception to the rule, and these data are of great interest to the data reduction group. Continuous listening is the only way to uncover conditions that cause reception of 2-meter signals from extreme ranges. Include if possible the HI-rate (number of seconds to count 10 HIs). Signal strength can be obtained if your receiver has an S-meter. Subtract the S-meter reading due to noise from the S-meter reading when OSCAR is on. Multiply this difference by 6 db. (one S-unit = 6 db.) and enter the result in column 4.

FORMAT II

Same requirements as Format I, except:
 Antenna: Rotary, multi-element 2-meter beam, with azimuth direction indicator at receiver location. Set indicator to read 0° when beam points to TRUE NORTH. Read indicator 0° to 359° clockwise.

Personnel: Three — receiver operator, antenna operator, clockwatcher/recorder.
Data Required: Where Entered on Form:
 A. GMT OSCAR first heard Column 1
 B. Azimuth bearing where first heard Column 2
 (Followed by observations each succeeding integral minute)
 C. Azimuth bearing at each minute noted in Column 1 Column 2
 D. Signal strength (db. above noise level) Column 4
 E. GMT OSCAR faded out Column 1
 F. Azimuth bearing when faded out Column 2
 G. HI-rate Column 5

Procedure:
 This format is applicable to stations which have a rotary beam, with the direction indicator visible from the receiving location.
 Antenna operator points antenna in the predicted direction. Receiver operator sets receiver to correct frequency, or tunes slowly around the expected frequency. (Antenna beamwidth eliminates any need to turn the antenna until after acquisition.) Receiver operator calls out when he first hears the OSCAR signal, and clockwatcher/recorder enters (in column 1) the time. Antenna operator swings beam back and forth across signal and calls out azimuth bearing of maximum signal strength. Clockwatcher/recorder enters this bearing in column 2 after notation of the time. Receiver operator tunes in signal for best reception. Clockwatcher/recorder alerts antenna operator several seconds before next integral minute, and antenna operator swings beam back and forth across signal, trying to have the beam pointed in the direction of maximum signal strength exactly on the minute, and then calls out the bearing for the clockwatcher/recorder to enter in column 2. Receiver operator keeps signal tuned in and the beat-note in audible range. Antenna operator watches signal strength indicator, clockwatcher/recorder watches the clock, and records the time and bearings as called out by the antenna operator. When the signal fades the receiver operator calls out, and the clockwatcher/recorder records the time. Receiver operator can count the HI-rate and call it out for the clockwatcher/recorder to enter in Column 5.

Obviously, all three people must be close enough to hear one another, and each should be able to see the clock.

(Continued on page 164)



BY GEORGE RAND,* K2DNJ

The Case of the Mysterious QRN

A STRANGE series of intense noise pulses began appearing on the ham bands in our neighborhood several months ago. At first, these would persist for a period of several minutes and then stop. The individual pulses would have a duration of two or three seconds and were repeated at intervals of about five seconds. After several days at this rate, the Mysterious QRN became more persistent and within two weeks it was on almost continuously. The pulse rate — on for several seconds, off for about the same period — was so regular that it suggested some sort of mechanical timer. Although our chief concern, of course, was the effect in the ham bands, we found that the Mysterious QRN covered all bands on the HQ-180 with practically equal intensity, and only loud short-range signals could be pulled through.

All hams in the neighborhood were suffering from the QRN but apparently each thought at first that he was the only one being bothered. After about two weeks, however, with DX records at an all-time low, we began to compare notes. Herb, W2EEJ, called one evening to say that he had stayed up until 3 A.M. trying to track down the Mysterious QRN and that he was ready to sell his gear and move out of town. His 20-meter skeds were thrown out the window, he said, and he was taking tranquilizers to steady his nerves. Well, this was it. We decided that immediate action was necessary and we drew up a plan of attack.

Our strategy included a visit to the homes in the area, a survey with mobile gear, and an undercover spy hunt with W2EEJ's wartime OSS pocket short-wave receiver. Within three days our hunt for the culprit had at least this partial success: The Mysterious QRN was limited to a two-block-square area around our QTH. It was definitely interfering with TV sets. It was defi-

nately radiated through the air (it did not come entirely through the 60-cycle lines to our receivers as we originally suspected). And we were able to pinpoint the source with a loop as being located in one of two adjacent homes. One home was given a clean bill of health, but the second practically halted our investigation. Our field-intensity measurements showed the Mysterious QRN to be centered on this house, but the occupants never seemed to be at home.

By now, the various neighbors we had visited during the survey began to call us and to ask when their TVI would be eliminated. They were very cooperative when we shut off their heaters and pulled the fuses and almost ripped the house wiring apart but, by now, they seemed to suspect (as they probably did all of the time) that we, or some other local hams, were the cause of the Mysterious QRN and their TVI. After a week of this, the missing link in the puzzle — the owners of the home where our loops showed the QRN to be centered — returned from their vacation. Now our hunt neared its end. We put on our ties and jackets and approached our target. The reception was cordial, but soon the atmosphere changed. "Our house causing the interference? We can't watch TV any more, but isn't it you hams who are causing all this trouble? We have already notified the FCC." The only solution now was to call in a third, unbiased party. This turned out to be a very capable engineer from the local lighting company. By the use of diplomacy and patience, we conclusively located the Mysterious QRN generator in the home under suspicion. The defective unit was replaced in ten minutes, the Mysterious QRN disappeared and everyone became the best of friends over a few drinks.

What was it, do you ask? What caused our loss of DX contest credits, strained our nerves, almost caused us to sell our ham gear, and was responsible for complaints to the FCC by our neighbors?

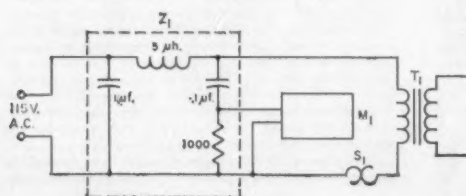


Fig. 1—Setup for checking the defective bell-ringing transformer. M_1 is a Stoddart NM-20A R.F. Interference and Field-Strength Meter. T_1 is the defective transformer with its thermal cutout S_1 . Z_1 is a line-stabilizing network presenting a known impedance for measurement purposes.

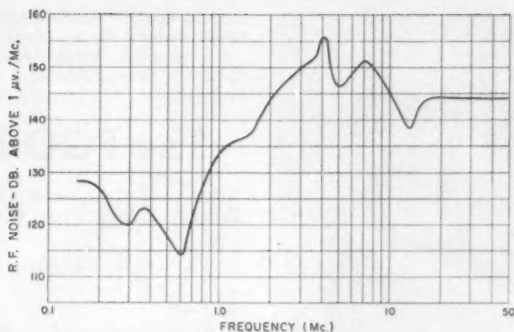


Fig. 2—Chart showing r.f. noise intensity vs. frequency.

It's all very simple now, of course. The cause of the Mysterious QRN was an innocent-looking defective bell transformer with a thermal cutout switch! The secondary was shorted and the excessive primary current caused the bimetallic protective switch to open with an arcing action. When the circuit opened, the bimetallic element cooled and several seconds later again closed the circuit with an additional arc. This action was repeated over and over again and the result was the most annoying r.f. interference we have ever heard.

This was the end of our field work. We resumed our DX skeds but our job was not done. Into the lab we went, screwdriver and pliers in hand. Let's dissect this beast. The results completely confirmed our initial findings. First, we checked the secondary winding of the transformer and found a definite short. When power was applied to the primary, the transformer became warm and after a short while we saw the bimetallic switch in series with the primary open up with an arc. A

few seconds later, the bimetallic element cooled and the switch slowly closed with another visible arc. Whenever this arc occurred, we saw the Mysterious QRN on our lab scope and heard it on the communications receiver. As a final test, we shorted out the switch and placed a piece of paper between the contacts to make sure that the switch was not in the circuit. The transformer became hot but there was not the slightest QRN, or signal on the scope. This concluded our spy hunt for the Mysterious QRN, but we did borrow some additional test gear and run an r.f. noise measurement test on this abominable transformer switch to see how efficient an r.f. source it was. The test circuit and the radiation data are shown in Figs. 1 and 2. As the curve shows, the Mysterious QRN has a high intensity and covers a very wide band of frequencies — at least up to the 6-meter band where our measurements ended.

Case closed! QRX for a minute — the land line is ringing. It may be another call for the Mysterious QRN detectives!

QST

NEW BOOKS

So You Want To Be a Ham, by Robert Hertzberg, W2DJJ. Published by Howard W. Sams & Co., Inc., Indianapolis, Indiana. 5½ by 8¼ inches, paper cover. Price, \$2.95. Cat. No. HAM-2.

This second edition has been revised and enlarged to include the latest commercial equipment and kits that can be used to outfit an amateur radio station.

How To Fix Transistor Radios & Printed Circuits, by Leonard Lane. Published by Gernsback Library, Inc., 154 West 14th St., New York 11, N. Y. Vol. 1 & 2, Cat. No. 96. 159 pages, including index. 5½ by 6½, paper cover. Price, \$3.20 each.

These books are revised versions of a transistor radio repair course directed to the radio service technician. Volume I starts off with semiconductor fundamentals. It then goes into basic amplifier, r.f. and i.f., detector and a.g.c. circuits. The last chapter gets into the practical side of repair, with information on transistor collector current

stabilization, intermixing power transistors, replacing transformers, etc.

Volume II continues the servicing idea with chapters on servicing methods, alignment and measurements, printed circuits and transistor types. The two chapters on servicing methods contain excellent information on the tools and equipment needed, making voltage measurements, checking transistors, using scopes and v.t.v.m., measuring local oscillator voltage, measuring bias, etc. The texts are chock-full of schematic and pictorial diagrams. A section at the rear of Volume II contains tables which list typical troubles and servicing techniques, along with references to the proper chapter.

Practical Auto Radio Service & Installation, by Jack Greenfield. Published by Gernsback Library, Inc., 154 West 14th St., New York 11, N. Y. Cat. No. 87. 160 pages, 5½ by 8½ inches. Price, soft cover, \$2.95; hard cover \$4.60.

This manual covers all types of auto radios — vacuum tube, hybrid and transistor. It includes information on the equipment and components needed to set up an auto radio servicing shop, tells how to remove and install receivers and speakers, and how to troubleshoot and repair all types of auto radios. Also covered are f.m. tuners, interference suppression, auto phonographs and power supplies.

(More on page 158)

section which served as an electronic switch or square-wave generator. In Fig. 1, the first triode section has been eliminated and the weight bias is obtained from a variable tap on a voltage divider across the power supply. The transmitter is keyed by a relay in the plate circuit of the square-wave generator as in the original arrangement by W3FQB.

Adjustment

All too often so-called "simplifications" result in tricky adjustment. "POO-Key Jr." proved to be a pleasant surprise in this respect, and all that is required is a little patience and a v.o.m. With the ohmmeter hooked across the relay contacts and the key in the dash position, adjust the weight control to give $\frac{3}{4}$ -scale deflection of the ohmmeter. This sets the mark-space ratio at 3:1 for correctly-formed dashes. Now press the key to the dot side and adjust the ratio control for mid-scale reading of the ohmmeter. This sets the mark-space ratio at 1:1 for dots and also automatically adjusts the dot-space to dash-space ratio at 1:2. There is no ratio adjustment for dashes since the dots are set to give the necessary ratio of 3:1 relative to the dashes. This simplifies adjustment quite a bit since no balancing back and forth between the two is required in attempting to find the ideal.

Once these adjustments are completed, no further steps are necessary except to set the speed as desired. As a check on the speed, it is interesting to note that the number of dashes in five seconds is equal to the w.p.m. setting of the keyer, assuming that the operator spaces his characters correctly. This last observation is not a brain child of the writer, but was determined quite a few years ago by experts in this field.

In the event the correct weight cannot be arrived at as described, it may be necessary to vary the value of R_4 and/or the spring tension of the relay so that the weight potentiometer will cover the desired range. The speed range may also be varied to suit the individual by altering the value of the timing capacitor C_1 and/or the 220K timing resistor. Both weight and speed ranges are dependent upon the characteristics of the tube, relay, and other factors, and some juggling may be in order.

The construction is very noncritical. The enclosure used, shown in the photograph, is a $2\frac{1}{4} \times 2\frac{1}{4} \times 4$ -inch Minibox, but anything from a bread board to a cigar box will be quite FB.

I'm quite sure POO-Key Jr. won't revolutionize the keyer industry, but it is a nice little project, gives good results and won't break the piggy bank even if ye olde junkie box is bare!

QST

Strays

Here's the September and October schedule for Air Force MARS Eastern Technical Net, meeting Sundays at 1800Z on 3295, 7540, and 15,715 kc.

- Sept. 10 — Business meeting.
- Sept. 17 — Doing the Job with Photoelectrics.
- Sept. 24 — Communications Receiver Design Considerations.
- Oct. 1 — Electric Power Generation in the Atomic Age.
- Oct. 8 — S.s.b. — Superiority and Specifications.
- Oct. 15 — S.s.b. — Equipment Operational Techniques.

Look for K6JBV on about 7085 kc. He's making a bike trip across Canada and down the east coast of the U. S., and will be on the air evenings with a 2-watt battery-powered rig.

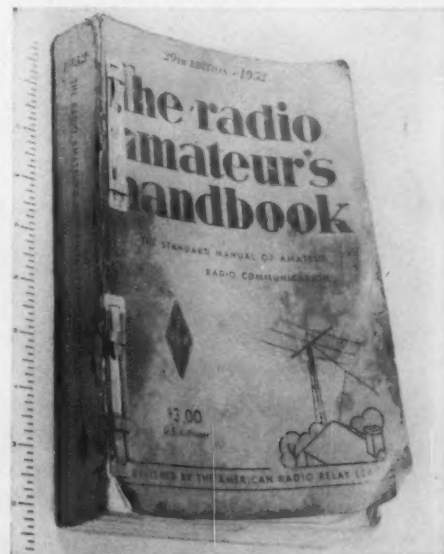
K0WVG (David Ericson, 1338 7th Ave., Holdrege, Nebr.) wants other ham coin collectors to write him.

W1LWV (Nick Thompson, 99 Water St., Millinocket, Me.) wants to hear from hams who breed German Shepherds.

VE3FW, 80 years young and proud to be a ham, suggests that all amateurs should wear a lapel pin to proudly proclaim that they are hams. Good idea, Pat — why not make it an ARRL emblem and be doubly proud?

Sixteen-year-old K7MEY from Phoenix, Ari-

zona, is off for a six-month's stay in Israel as an exchange student. He is taking some gear with him and hopes to get a 4X4 call.



W5KOK gets extra long service from his Handbooks by reinforcing them as shown in the photo above.



Built in a $2 \times 4 \times 4$ -inch box, the WWV Converter takes up very little room alongside the receiver. The 5- and 10-Mc. standard frequency transmissions are converted to the 3.5- and 7-Mc. amateur bands, respectively.

WWV on Your Ham-Band Receiver

FOR most of us, the advantages of the amateur-band-only receiver far outweigh the disadvantage of not being able to tune in non-amateur signals. However, there is one non-ham signal we all like to get—WWV. The various services carried by this station and WWVH aren't duplicated by the 100-ke. crystal standard that is now a customary receiver accessory.

While some amateur-band receivers have provision for bringing in one or more of WWV's transmitting frequencies, many of them don't. The simple converter shown here will enable you to get the most used ones, 5 and 10 Mc., by superimposing them on the 3.5- and 7-Mc. amateur ranges.

The converter uses one tube, a 6BA7, with the oscillator section crystal controlled. Heater and plate power can be taken from the accessory socket that is found on most receivers. A single slug-tuned coil, L_1 , serves for both WWV frequencies; a small fixed tuning capacitor is used for 10 Mc. and a larger fixed-variable combination is switched in for 5 Mc. The crystal oscillator uses capacitive feedback for fundamental operation, the circuit being the familiar one with a "hot" cathode. A tank circuit, L_2C_4 , connected in the oscillator anode circuit, picks off the second harmonic.

The crystal frequency is 8500 kc., in round figures. (Any frequency between 8500 and 8650 kc. will keep the converted signal inside the amateur band limits.) The fundamental frequency is used to convert the 5-Mc. signal to 3.5 Mc., and the second harmonic on 17 Mc. converts the 10-Mc. signal to 7 Mc. The converted output is

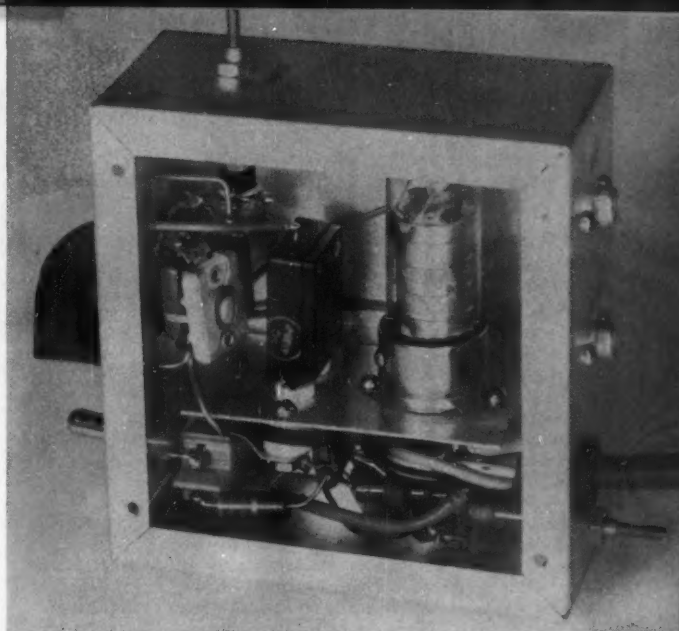
This should be a welcome accessory for receivers which now can't tune in WWV, for who doesn't have frequent need of the standard frequencies and time signals that WWV offers?

choke-capacitor coupled to the receiver's antenna input circuit.

The assembly shown in the photographs is in a small aluminum box with removable sides. Stood on edge, it takes up very little operating-table space. This is merely one of many forms in which it could be built, since there is little in the layout that requires particular care. The leads in the r.f. circuits shouldn't be unduly long, of course. Otherwise you can use any layout plan that appeals to you. The principal thing, from an operating viewpoint, is that the frequency-selector switch, S_2 , and the on-off switch, S_1 , should be easily accessible. One pole of S_1 is used to transfer the receiving antenna from the converter directly to the receiver. The second pole turns the B plus on when the converter is in use and turns it off when the antenna goes directly to the receiver.

Only a few preliminary adjustments are needed, once the wiring is finished. With power applied and S_1 in the "on" position, set S_2 for 10 Mc. and set your receiver to 7000 kc. If the frequency of Y_1 is not exactly 8500 kc. the proper 7-Mc. frequency will be the difference between 10 Mc. and twice the crystal frequency. For example, if the crystal frequency is 8575 kc., its second

The tube and crystal sit on top of a small aluminum shelf mounted on one side plate of the box. S_1 and S_2 are mounted on the front edge. L_1 is mounted on top, with the slug adjusting screw available for convenient alignment. J_1 , J_2 and L_2 are on the rear edge. The power cable also comes out the rear. Other components are wired to the crystal and tube sockets.

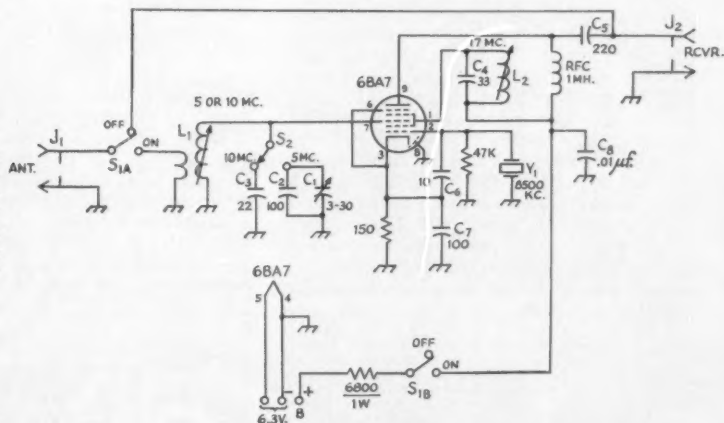


harmonic is 17,150 kc. and the difference frequency is $17,150 - 10,000 = 7150$ kc. Turn the adjusting screw in L_1 for maximum noise or response to any signals that may be picked up near 10 Mc. If it's the right time of day for good signals from WWV you'll hear that station and can peak L_1 on it. Then adjust the slug in L_2 for maximum signal. Next, set your receiver to 3500 kc. — that is, to the difference between the crystal fundamental and 5000 kc. — and set S_2 in the 5-Mc. position. Then adjust C_1 for maximum signal from WWV. After this there's nothing

to be done except to put the cover on the box and use the gadget whenever you need it.

The same scheme probably can be extended to other WWV frequencies such as 15 and 20 Mc. On each successive crystal harmonic you move to the next higher amateur band. However, it might be necessary to use a separate oscillator and harmonic amplifier to get good conversion efficiency on the higher harmonics. Also, it would be necessary to use more than one coil in the signal-frequency circuit. No doubt other variations will occur to the interested reader. — G. G.

Fig. 1 — Circuit diagram of the 5-10-Mc. converter. Except where indicated otherwise, capacitances are in $\mu\text{mf.}$, resistors are $\frac{1}{2}$ watt. "B" voltages up to 250 volts can be used.



C_1 —3-30- $\mu\text{mf.}$ compression trimmer.

C_2 — C_7 , inc.—Mica.

C_8 —Ceramic disk.

J_1 , J_2 —Phono jack.

L_1 —Approx. 8 $\mu\text{h.}$, slug-tuned. (North Hills 120-C, Miller 4406, or equivalent.) Link is 2 turns No. 28

insulated wire wound around grounded end of coil.
 L_2 —Approx. 2.5 $\mu\text{h.}$, slug-tuned (North Hills 120-A, Miller 4404, or equivalent.)

S_1 —D.p.d.t. toggle.

S_2 —Rotary, 1 pole, 2 positions (Centralab 1460).

Y_1 —8500 to 8650 kc.; see text.

May 21 Was a Day to Remember

AMATEUR radio operators are to be congratulated for their excellent performance on Armed Forces Day 1961. The operating skill, technical know-how, and patience of the amateurs established new records in all phases of the communication activities. The total number of QSOs and competition entries far exceeded expectations. AIR, NSS, and WAR contacted 4246 U. S. and foreign amateurs.

The colorful one-time only QSL cards have been mailed to all contacts that could be identified in the *Callbook*. Some cards have been returned as being unclaimed at the address listed. If you contacted either NSS, WAR, or AIR on 20 May 1961 and have not received your QSL, you may write to the Armed Forces Day Contest, Room 5B960, the Pentagon, Washington, D. C., for a confirmation.

Certificates of Merit have been mailed to 736 contestants in recognition of making a perfect copy of the Secretary of Defense's International Morse Code message to radio operators on Armed Forces Day 1961. The message was transmitted at twenty-five words per minute by military stations on 20 May 1961. Certificate winners were:

N1AAU, N1ABA, W1AJL, N1ASA, K1AWR, W1BB, W1BDI, W1BGW, W1BUC, W1BWM, K1BJP, K1BUB, W1CBT, W1CWM, K1CUE, W1DEL, W1DMD, W1DVF, W1FDN, K1GGG, W1GYP, W1GZQ, W1HJP, K1HNO, W1IKE, K1IUM, K1JHH, K1KBH, K1KBO, W1LME, W1LZL, W1MCG, W1MCL, W1MEG, K1NOW, K1NSF, W1NTH, W1OJL, K1OIB, W1QBY, W1QJL, W1QMJ, W1RAM, K1RBC, K1RBP, K1RCF, W1RGB, N1RRS, W1RAD, W1SGU, W1SJM, W1SRM, W1TO, K1USA, W1WPR

W2ALZ, W2AMH, W2AZZ, K2BG, A2BVE, W2BYC, K2CE0/4, W2CLX, W2COG, K2CX0, W2CXO, K2DEM, W2DIG, W2DUD, W2EFN, W2EJL, K2EQP, W2FQW, W2FTL, K2GKG, W2GKZ, W2GLU, W2GGM, W2GQY, W2GR4, W2HCH, K2HGK, W2HLD, W2HX, W2HZA, W2IIM, W2JGO, W2JJD, W2JOA, W2JTN, W2JUW, W2KJP, W2KLD, W2KRK, W2KVR, W2KWB, W2LJL, W2LRW, W2LYH, K2MBX, W2MDM, W2MZW, W2NGP, W2NHV, W2OBX, K2OCU, W2OKK, W2OQV, W2OXK, W2PIV, K2RBD, W2RUZ, K2SFY, W2SKX, K2SXX, W2SWC, W2TFN, K2TOU, K2TPR, W2TUK, K2UFT, K2UQZ, W2URP, K2UTU, W2UXY, K2WAW, K2YJL, K2YQK, W2ZDD, W2ZMK, W2ZVN, W2ZUX, K2ZZW

K3AAY, WPE3ACT, W3ADE, W3AEL, W3AHX, W3BFF, K3BGY, W3BHP, W3BKE, WPE3BWV, W3CA/A3CA, W3CAF, W3DFS, W3DOB, W3EJU, W3EMH, W3ID, W3ELI, W3EOV, W3FAC, K3GJL, W3GJL, K3GHI, A3GHT, W3GVR, W3HCB, K3HTY, K3HTZ, K3HWI, K3IMP, K3INF, K3IPA, K3IPK, K3IUV, W3JBP, K3JDE, K3JYZ, W3KMD, K3LDB, W3LQV, W3LYN, W3MCG, W3MER, W3MFW, K3NGB, K3NLU, W3NWA, W3OBU, W3OY, W3PYW, W3QHF, W3QID, W3RDE, A3RYX, W3TFN, W3VD, W3VQL, W3VXV, W3WZC

W4ABY, W4AIV, W4ANF, K4AO, K4AB, K4ABW, W4BWZ, W4CDA, W4CH, W4CIA, K4DAD, W4DDQ, W4DLA, W4DVT, W4FDS, W4FOR, W4FOV, K4GFL, K4GLD, K4GPH, K4HBT, K4HOE, W4HOS, W4HQN, K4IFR, K4IFZ, A4IGD, W4IKS, W4IMC, W4IPN, K4IPV, K4IVZ, W4JDU, K4JFH, W4JJU, W4JRA, W4JSJ, W4KFY, W4KJ, W4KLT, W4KNS, W4KR, K4LIE, W4LYN, W4LYN, W4MCH, K4MTL, W4NIV, W4NPG, K4NRL, W4NTE, K4NTS, W4NYX, K4OKL, K4OLD, W4OPB, W4OUL, K4PVP, W4PZS, K4QFV, W4QVJ, K4QZV, W4RBZ, W4RHZ, W4RQK, W4SDR, K4SHJ, K4TGG, W4UNA, W4USQ, W4VCX, W4VHX, W4WDF, W4WHK, W4WZM, K4YOQ, W4YWX, K4ZCH, W4ZGE

W5AHC, W5ANR, W5BCF, W5FBM, W5BW, K5CAT, W5CCE, W5CKZ, W5CME, K5DNO, K5EQB, K5ESK, W5GKY, W5GOG, W5GVV, W5GYR, W5HBD,

W5HFN, K5HQC, W5IRM, K5IGZ, K5JY, K5LAZ/6, W5AFSL, W5ALT, W5NKH, W5OFH, W5OFH, W5OWL, W5PVE, W5PYU, W5PZA, W5RIH, W5SDP, W5SGJ, W5SQB, W5UY, K5WBA, W5WJI, K5YJA, W5YOQ, W5ZSX, W5ZU

W6AAQ, W6ABA, A6AEE, K6GAKJ, W6AXV, W6AYI, W6BHG, W6BHI, K6BLT, W6BYV, W6CBX, W6CDW, W6CG, A6CJP, W6CKU, W6CLB, K6CNO, W6CUJ, W6GCF, K6PVE, W6DCH, W6DIX, K6DV, W6DVID, K6IDYH, K6DYX, W6EOP, K6ELT, W6ELT, W6EMO, W6ETJ, W6EY, A6FB, W6FHI, W6GFK, W6FNG, K6HFX, W6FYN, W6FYW, W6FZC, K6GB, W6GDD, K6GES, K6GK, W6GPD, A6GXS, K6GV, W6G/H, K6HB, W6HIF, K6HKO, W6HQR, W6HTS, W6IAH, W6IFO, W6IN, W6JAL, K6JEI, W6JKD, A6KFP, W6KHS, W6KMS, K6KPI, W6MXO, K6NAR, K6NBZ, W6NKE, W6NSK, K6OJJ, W6OJW, W6OWP, W6OWR, W6PCA, W6PCF, W6PJP, W6PMD, K6PSF, W6PYN, W6QIE, W6QIL, W6RDK, K6SKT, K6SST, K6TER, W6THQ, K6TPL, K6TWE, W6UZX, K6VCT, W6VRJ, K6VYJ, W6WAW, W6WBR, W6WLV, W6WNZ, W6WPI, W6WXX, W6WXX, W6YCF, W6YDK, K6YLS, K6YLT, W6YTG, W6ZLF, W6ZLO, W6ZPX, K6ZUH, K7ADJ, W7BHI, K7BPR, W7CNL, W7DCR, W7EDP, K7EEA, W7EWF, K7EXT, W7EYF, W7HIS, W7HIS, W7PPE, W7GCL, W7JAH, W7JMH, W7JQJ, W7JL, W7JVK, W7KQV, A7FKY, K7KYG, W7LPM, W7LZJ, W7MCU, W7MJM, K7NBM, W7NGW, K7MLD, K7NWA, W7OCX, W7ODS, K7OGF, W7PLI, W7SMR, W7RBE, W7TRL

W8AUD, W8BKM, K8BXG, K8COU, W8CXS, W8DAE, W8DSX, W8DSX, K8EUL, W8FFK, W8FLA, K8GKF, W8GAK, K8HKU, W8HS, W8JY, W8IKT, K8JLE, W8JPE, W8KNC, K8KUQ, K8KVV, W8LEX, W8LNR, W8PBO, W8PEI, W8PHM, W8PQQ, K8PRC, W8QCU, W8QLJ, W8QNW, W8RLR, K8RSI, K8RUE, W8SQU, W8SZL, W8TZO, W8VMP, K8VWH, W8ZHB

W9ALS, W9ANR, K9AOX, W9BMJ, W9BQC, W9BYM, W9CHD, W9CXY, W9DCA, K9DOL, W9DWV, W9EAY, K9EWQ, W9FKH, W9FVK, K9GDF, W9HAE, K9HNM, W9HTU, W9IDO, K9ISP, K9JL, K9JSM, K9KTX, W9LFL, W9LRV, W9MAK, W9MWQ, K9MXE, K9NRU, W9OQG, W9RAR, K9RFV, W9TCV, W9TTF, W9UZX, W9VBH, W9VHD, K9VJV, W9VNN, K9VYN, W9WBE, W9YNS, W9YPO, W9YZE, W9ZB, W9ZEN, W9ZMP, W9ZSQ, K9ZZA

W0AH, W0AJL, W0ARO, W0BBY, W0BHA, W0BNR, K0BRS, W0BWO, K0CST, W0DAQ, W0DEL, W0DUA, A0ECE, A0EHO, W0FDJ, W0FWD, K0GVB, A0IHC, W0ISJ, W0JBM, W0JHS, W0JZN, K0KTP, W0LCL, W0NHZ, W0NYU, K0OAL, K0ODE, W0OKH, W0OKO, K0OTH, K0P1V, K0QEC, W0QVA, W0RCV, W0RGS, W0TBL, W0TUT, W0UBA, K0UDG, K0WFF, W0WHE/7, K0WHL, K0YDD

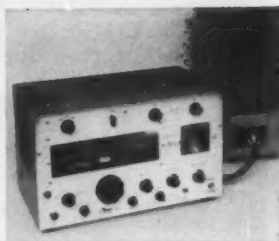
DL4BY, DL4DZ, DL5CS, DL5GP, K6H6GW, KH6DUD, KH6HB, KL7BDO, KL7DGO, KL7DIR, KH4AA, KZ5GH, KZ5TD, VE2AIL, VE3COO, VE3IA

Archer, F. O.; Arnall, H. D.; Arthur, E. D.; Baker, K. R.; Beetham, W. J.; Bell, N. E.; Bell, V. D.; Bernard, K. R.; Bonin, O. C.; Breneman, R. H.; Bryan, J. D.; Bumpus, J. C.; Castor, E. E.; Cloar, L.; Cole, H. H.; Conway, E. C.; Daniele, N. P.; Dean, D. B.; Desrosiers, G. J.; Devitto, L. J.; Doherty, P. J.; Doll, J. M.; Eikam, H., Jr.; Elgan, H. C.; Epperson, M. N.; Falcon, E. P.; Fox, N. T.; Fischer, R. L.; Ford, H. J.; Gerhart, C. H.; Gillham, H. J.; Goodman, T. J.; Goodwin, W. J.; Gray, A. H.; Grubb, R. A.; Guimond, R. D.; Hall, C. C., Jr.; Harbin, W. B.; Harris, A., Jr.; Harvey, J. W.; Hellmann, J.; Henese, P. H.; Hess, R. R.; Hinkle, J. F.; Hockenberry, R. G.; House, R. A.; Howell, J. M.; Humphrey, J. J., Jr.; Hynes, R.; Jablonaki, S. J., Jr.; Jarrell, G. W.; Johnson, J. J.; Jones, R. L., Jr.; Kampfer, D. R.; Kinsler, N. R.; Perkins, B. R.; Kramer, A. A.; Kwant, L. J.; Larson, A. C.; Larson, C. S.; Laycock, J. D.; LeBlanc, R. J.; Lumb, R. A.; Mateo, L. R.; Mayretie, E. D.; Meddles, J. G.; Miller, M. D.; Moad, J. H.; Morris, T. E.; Morrison, R. E.; Mosteller, R. C.; Mulcahy, T., Jr.; Murphy, L. T.; Nadworny, V. H.; Noyes, T. E.; Nunan, R. E.; Oberst, J.; Olivares, R.; Oppenheimer, E.; Parmelee, R. B.; Parsons, W. A.; Pea, O. B.; Perkins, B. B.; Peterson, J. M.; Pyatt, N. H.; Randall, M. D.; Reding, P. G.; Reiser, J. H., Jr.; Rembia, A.; Rodriguez, B. D.; Rogers, R. F.; Roy, J. A.; Ryan, T. H.; Seidler, E. R.; Simpson, G. B.; Smith, B. D.; Solomon, M.; Strzesieski, R. C.; Sweet, R. W.; Taylor, F. V.; Thayer, G. R.; Thomas, W. G.; Ungari, J. A.; Vanderhoof, J.; Wagenmans, J.; Walker, K.; Ward, F.; Ware, M. F.; Weaver, H. D.; Weeks, L. D.; Wheeler, H. R.; Wiggins, O. W.; Williams, C.; Wiaroth, R. H.; Witcomb, A. S.; Woffard, K. L.; Yalden, A. G.; Young, C. E.; Zuniga, A.

(Continued on page 134)

• Recent Equipment —

The Clegg Zeus V.H.F. Transmitter



HERE is a de luxe model transmitter for 50 and 144 Mc. capable of delivering 125 watts output on either band, with a.m.-phone or c.w. emission. Provision is made for either v.f.o. or crystal control, and the means by which the former is made to deliver satisfactory performance are of more than ordinary interest. The Zeus is, in fact, loaded with novel ideas of several kinds, and what follows should provide interesting reading for any present or prospective v.h.f. enthusiast, whether or not he expects to buy equipment of this caliber and price. As the result of these unconventional but eminently practical engineering features the Zeus combines flexibility, efficiency and signal quality in a degree seldom encountered in v.h.f. circles.

The Zeus is a two-package outfit. All r.f. circuits, controls, and the speech-amplifier portion of the modulator are in a compact unit intended for use at the operating position. Power supplies and most of the modulator are in a larger and much heavier assembly that can be placed anywhere within 10 feet of the r.f. package. A 20-foot extension is available for installations where greater separation may be required. The two units are designated 331 and 332, respectively.

R. F. Circuitry

The Model 331 r.f. unit is shown in block-diagram form in Fig. 1. The oscillator tube is a 6BK7, with its two triodes connected in parallel. It serves as both crystal- and self-controlled oscillator. The following 6AH6 stage is a Class-C frequency multiplier when crystal control is used, and a Class-A isolation stage and amplifier for the v.f.o. Next is a 6CL6 frequency multiplier. This drives a doubler in 144-Mc. service, or skips over to a straight-through amplifier when the transmitter is on 50 Mc. These two

stages are 7558 pentodes. (The 7558 is the modification of the 5763, for v.h.f. service.) The final amplifier is a 7034/4X150A. Between the driver plate and final-amplifier grid, and in the final-amplifier plate circuit, are two-band tanks of interesting design. These allow efficient operation on both bands, yet offer a high degree of insurance against radiation of energy on wrong frequencies.

The Zeus v.f.o. is unusual on several counts, not the least of these being that it is satisfactorily stable and free from hum- and frequency-modulation effects that plague most variable-frequency control systems used in v.h.f. work. The conventional v.f.o. approach has been to start on a low frequency, for stability, and then multiply many times to the operating frequency. The oscillator is usually a pentode, the idea being that such a tube affords better isolation for the frequency-control elements of the v.f.o. than a triode. These ideas work for v.f.o. control on 3.5 or 7 Mc., but they don't often stand up in v.h.f. applications. The oscillator may be reasonably stable at the control frequency, but when multiplication to as high as 144 Mc. takes place small drift and slight hum modulation and mechanical instability are blown up to wholly unsatisfactory proportions.

The Zeus v.f.o. does the job differently. The oscillator is a triode, or more accurately two triodes in parallel, with the tuned circuit covering 24 to 27 Mc. It is run at very low input, to avoid drift due to heating. Output is taken from the cathodes, and fed at low impedance to a Class-A isolation stage. The triodes' high transconductance and the light coupling to the following stage, plus extreme care in the matter of mechanical ruggedness, result in a v.f.o. that has a good note, even at 144 Mc. Its drift, after initial

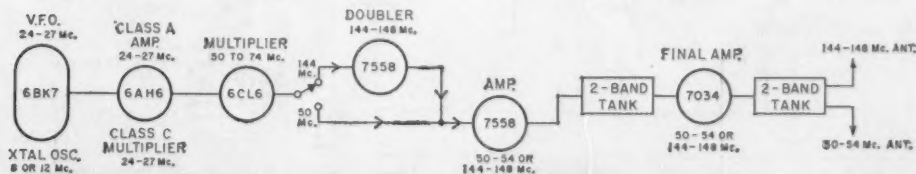
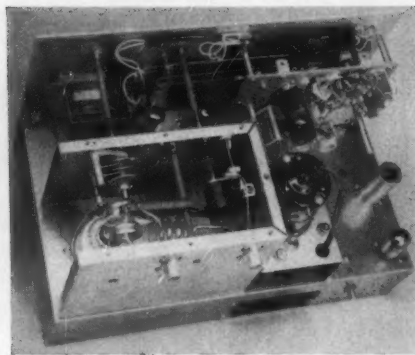


Fig. 1—Block diagram of the r.f. portion of the Clegg v.h.f. transmitter. Note that a triode v.f.o. is used, with its tuned circuit covering the 24 to 27-Mc. range.



Interior of the Clegg Zeus transmitter. The 7034 final amplifier stage is at the lower left. The coil directly over the amplifier tube is the 144-Mc. plate coil. V.f.o. components are at the upper right.

warmup, is practically nil, and even from a cold start it drifts less than some crystal oscillators used in v.h.f. work. The transmitter keys without observable chirp, and the frequency stays put under full modulation.

To make stability of this order pay off requires a good dial, and the Zeus has the English Eddystone¹ job that has become almost a standard item for v.f.o. and receiver tuning applications where accurate calibration and smooth tuning are musts. Thanks to lack of backlash, use of the vernier scale on the dial makes possible a reset accuracy of up to plus-or-minus 5 kc. Front-panel selection is possible for crystal control (8 or 12-Mc. crystals), 2-meter v.f.o., and 6-meter v.f.o. ranges. The oscillator runs at about 45 volts, from a regulated source, and the heater voltage is regulated.

Plate and screen voltage on the 6AH6 stage are also from a regulated source. The tuned circuits in this stage are broad enough so that their tuning can be fixed. Thus the first tuning control that is adjusted in normal operation is in the

plate circuit of the 6CL6, two stages and a frequency multiplication away from the oscillator, and well shielded and isolated from it. The 6CL6 doubles to 50 Mc. or triples to 72 Mc., its plate circuit tuning to 72 Mc. near the minimum setting of the plate capacitor, and to 50 Mc. near its maximum. Grid-block keying for c. w. is applied to this stage.

The 6CL6 output is carried via the band switch either to the grid of the 7558 doubler, for 144-Mc. service, or the grid of the second 7558, which is a straight-through amplifier on both bands. The first 7558 is disabled by the band-switch when the transmitter is on 50 Mc.

The basic circuit of the two amplifier stages is shown in Fig. 2. Where letter-number designations are given they are the same as used in the Zeus instruction book, in order to avoid confusion on the part of readers of the latter. The band-switch section, S_{6C} , is shown in the 50-Mc. position. Here the bypass capacitor, C_{33} , is not effective, as its low side is left floating, and the coils L_7 and L_8 are tuned together, by C_7 , to 50 Mc. This occurs near the maximum setting of C_7 . With the switch in the other position the center tap of L_7 is brought to ground potential for r.f., and L_8 looks like an r.f. choke feeding the center tap with d.c. The circuit then tunes to 144 Mc., and the value of L_7 is such that it resonates in the 144-Mc. band with C_7 near its minimum setting.

A somewhat similar arrangement is used for two-band operation of the final plate circuit. The center-tapped L_{12} is the 144-Mc. plate coil, series-tuned by C_9 . Output is coupled out through a swinging link, L_{16} . For 50 Mc. L_{12} and L_{13} combine to work as a pi-network tank circuit, with C_9 as the tuning capacitor and C_{10} as the loading capacitor. The really neat trick here is that L_{16} and C_{10} are ganged to a single control and arranged so that when C_{10} is tuned properly for working into a 50-ohm load at 50 Mc. the link coil, L_{16} , is remote from the 144-Mc. tuned circuit. The values in the tank circuit are apportioned so that C_9 tunes near minimum for 144 Mc. and near maximum for 50 Mc., as in the earlier examples.

¹ New Apparatus, QST, April 1960, p. 17.

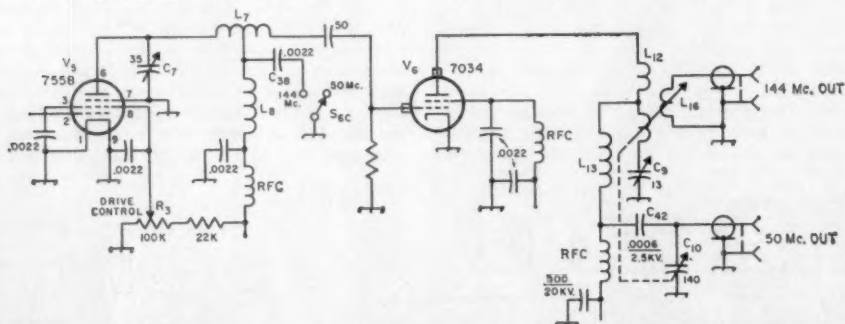


Fig. 2—Basic circuit of the last two stages of the Zeus. Operation of the two-band circuits is explained in the text. Efficient operation on both 50 and 144 Mc. is achieved without switching elements in the r.f. portions of the circuits, yet there are automatic precautions against radiation on unwanted frequencies.

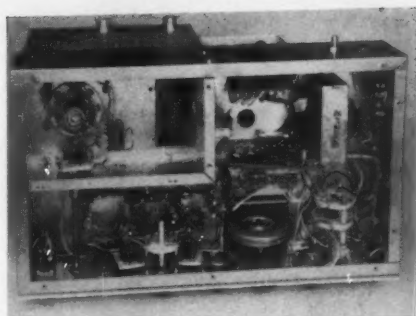
Separate output receptacles are provided for the two bands. Separate antenna relays can be connected to these, or the same relay moved from one to the other as operation on the two bands dictates. Current for actuating the antenna relay is obtainable from an accessory socket on the power unit. Receiver muting is also available from the same source.

The screen voltage applied to the driver tube, V_{b1} , can be controlled by means of a front-panel control, R_3 . The primary purpose of this is to set the drive to the proper level for the type of service, but it has other possibilities. The antenna experimenter, for example, will find it extremely useful, in that it permits the final stage to be operated at any level of power output from zero to maximum. Because the 7034 screen is clamp-tube controlled, running the amplifier grid drive down cannot result in excessive plate or screen dissipation.

Audio and Power Supply

The audio lineup of the Zeus is shown in Fig. 3. The small block at the left shows the tubes and functions that are built into the r.f. unit. The output from the cathode follower is brought through the power cable to the Model 332 power supply and modulator section, where it first encounters two 1N34s in a low-level clipper-filter circuit, actuated by peak detection of modulator output. There are two gain controls. One, on the back of the r.f. unit, presets the gain in such a manner that the clipping level control, on the panel of the r.f. unit, may be used to suit the conditions under which the operator is working at the moment. Once these are set up for the microphone and operator voice characteristics, a neon lamp on the panel gives a constant check on the modulation level. It blinks or goes out entirely on modulation peaks, depending on the setting of the clipping control.

Up to 18 db. of clipping is possible, and for maximum modulation effectiveness under weak-signal conditions a high level of clipping is desirable. For local communication, or at other



Bottom view of the Zeus, showing the 2-band grid circuit of the amplifier stage, upper left. Exciter stages are at the lower left.

times when maximum readability is not important, more pleasing quality is obtained with lower clipping levels. Filter characteristics are such that, with 3 db. clipping, modulation is flat to plus or minus 3 db. from 350 to 3000 cycles. It is down more than 10 db. at 200 and 3600 cycles, and more than 18 db. at 120 and 4200 cycles. This results in reasonable naturalness of voice, but with excellent characteristics as to readability. With high clipping levels a very high average modulation percentage is obtained automatically, yet overmodulation and splatter are prevented under all conditions of operation.

The intermediate stages of the modulator consist of a 12AT7 cathode-coupled phase inverter, and a 6BX7 direct-coupled cathode-follower driver. The 6BX7 cathodes are connected directly to the grids of the 811 Class-B modulator tubes. The output transformer is specially designed to transfer power in the proper proportions to the 7034 plate and screen. The functions of the 6W4 and 6C4 are obvious from the block diagram. A modulation peak in excess of the desired level produces a signal that controls the bias on the low-level (1N34) clipper. Time constants are set so that corrective action takes

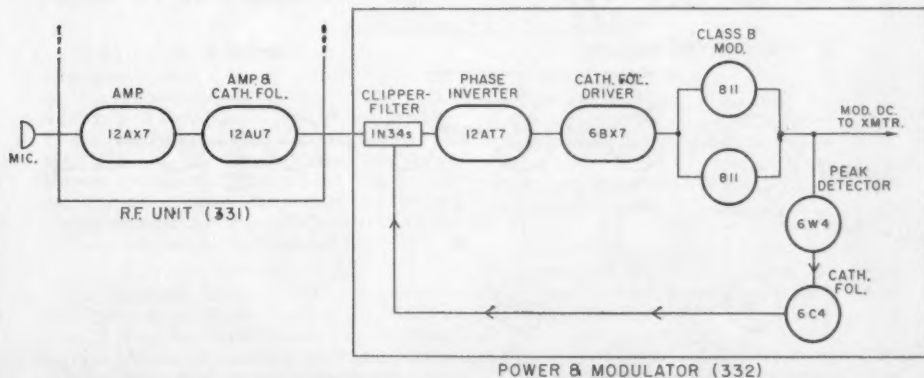


Fig. 3—Block diagram of the audio and power supply portion of the Zeus v.h.f. transmitter. Adjustable clipper-filter system provides highly effective modulation with minimum signal bandwidth.

place in less than 100 milliseconds. Release time is of the order of 50 milliseconds.

The power supply delivers 325 volts d.c. for all stages of the transmitter except the modulator and final amplifier. The latter two stages run on 875 volts from a separate rectifier system. A 6BX7 is used as a d.c. clamp tube for the 7034 screen circuit. Regulated voltage for the oscillator and Class-A amplifier, and a negative bias voltage for the keying system, are obtained from the 325-volt supply.

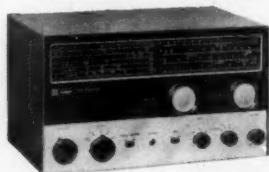
Operation of the final stage and modulator tubes at 875 volts means that both are running well below their maximum ratings. This results in a transmitter that is very tolerant in adjustment. If it is working into loads that are reasonably close to 50 ohms, harmful misadjustment of the

Zeus should be almost impossible, provided the simple instructions are followed. — E. P. T.

Zeus V.H.F. Transmitter

	R.f. Unit	Power supply modulator
Height:	9 inches	11 inches
Width:	15 inches	17 inches
Depth:	9½ inches	13 inches
Weight:	25 pounds	30 pounds
Power requirements: 600 watts, 117 volts, 60 cycles.		
Price class: \$600.		
Manufacturer: Clegg Laboratories, Mt. Tabor, New Jersey.		

Knight-Kit R-55 5-Band Shortwave Receiver



THE newest addition to Allied Radio Company's line of receiver kits is the Knight-Kit R-55 receiver. Designed for the beginning amateur operator and short-wave listener, this receiver offers an economical way for a novice to get started and to gain some valuable experience in the construction of a receiver. Referring to the block diagram in Figure 1, the receiver is a 6-tube, single-conversion superheterodyne, with continuous coverage of the frequency range 530 kc. to 36 Mc. in four ranges. Also included is a fifth range, which allows coverage of the 6-meter band (50 to 54 Mc.). All amateur bands have electrical bandspread calibrated to read frequency directly in megacycles. The band-set drive takes 13 turns of the knob to cover any of the four ranges: 0.53 to 1.9 Mc., 1.8-6.3,

6-14.5, and 11.5-33 Mc. Bandspread requires 13 turns for 80 and 40 meters, 4 turns for 20 meters, and 9 turns for 15, 10 and 6 meters.

The receiver is quite conventional in its electrical and mechanical characteristics. The circuitry is fairly straightforward — a mixer stage, two 1650-kc. i.f. stages, a b.f.o., and two stages of audio amplification. A 6BE6 functions as a pentagrid mixer, and the input and oscillator circuits are tracked. The oscillator in the penta-grid circuitry is a Hartley type, operating either 1650 kc. above or below the signal frequency. A 6BZ6 and the pentode section of a 6AW8 serve as the 1650-kc. intermediate-frequency amplifiers. A 6AL5 is used as the detector and as a series-type noise limiter. The noise-limiter stage provides automatic noise limiting during a.m. reception

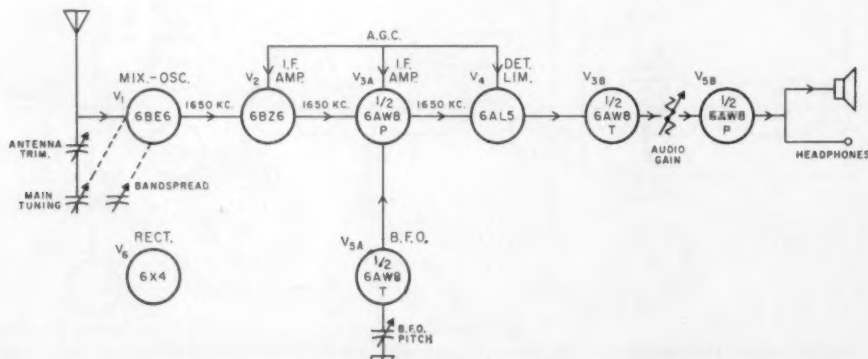
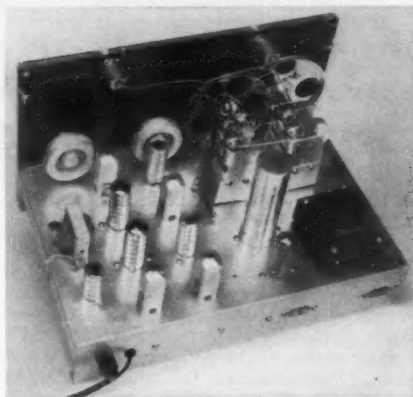


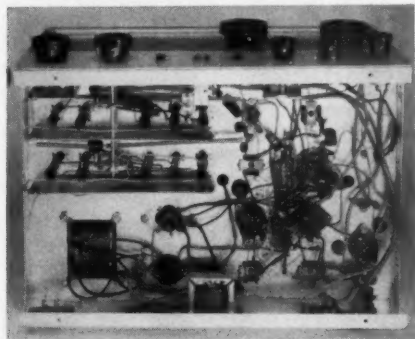
Fig. 1—Block diagram of the R-55 receiver

only. The triode section of a second 6AW8 functions as the beat-frequency oscillator. The lineup is rounded out by two conventional stages of RC-coupled audio. The power supply uses a center-tapped transformer and 6X4 rectifier. The center tap of the power transformer is brought out to a terminal strip at the rear of the receiver to provide for muting.

The R-55 is available only in kit form, although the unit received here was prewired. Study of the instruction and assembly manual indicates well planned, easy to follow, step-by-step instructions. Any beginner who has mastered the correct technique of soldering should encounter little difficulty in putting the receiver together, provided he is willing to follow the instructions properly. A complete 48-page manual is included with the receiver, along with several wall-size picture diagrams. The book gives all of the information necessary to assemble, wire, align, install and use the receiver. The manual even contains information on propagation to



Both the general coverage and bandspread dials are string driven and have flywheels. Rear apron connections are, from right to left: antenna input, muting terminals, line cord and fuse. All the tubes have shields, with the exception of the rectifier.



This bottom view of the R-55 shows the mixer and oscillator coils at the upper left of the photograph. Directly below is the power supply section. I.f. and audio circuitry occupy the right side of the chassis.

enable the operator to pick the best time and place to listen on the various frequencies.

The kit is supplied complete with metal cabinet, tubes, built-in 3½ inch speaker, all components, and even the wire and solder. An optional 100-kc. calibrator for the receiver is also available.

— K. C. L.

Knight-Kit R-55 Receiver

Height: 8½ inches.

Width: 14¼ inches.

Depth: 11 inches.

Weight: 19 pounds.

Power requirements: 60 watts, 117 volts, 60 cycles.

Price class: \$68 (kit only).

Manufacturer: Allied Radio Co., Chicago 80, Ill.

Strays

The Chiburban Radio Mobileers, a group that concentrates mainly on 160-meter mobile, decided to run code classes, and obtained permission from a daytime-only broadcast station, WCGO, to use their antenna system at night. At 1930 local time each Tuesday night they load up on 1810 kc. with 35 watts and put out a potent signal. The antenna system consists of two 158-foot towers with 180 200-foot radials at each tower, and so it's no wonder they get out like crazy.

The Hamilton (Ontario) ARC will sponsor a training course in amateur radio at the Hamilton Central Secondary night school. Twenty 3-hour sessions will be held starting in October. These sessions will include lectures, practical demonstrations, and code training. For further information, contact HARC president VE3CEC.

STOLEN EQUIPMENT

On May 1 the following equipment was stolen from the car of Allan Lurie, W9KCB, 695 E. Armstrong Ave., Peoria, Ill. A 6-meter Gonset Communicator, civil defense model, 3136CD, serial F-1481, an Astatic ceramic crystal mike M-101, and an aluminum transmitter rack and transmitter crystals.

A Gonset Communicator III Serial No. E1353 was stolen from Charles E. Hummer, 21 S. West St., York, Pa., while he was visiting in the Baltimore area. The thieves took the car, too.

A Gonset 6-Meter Communicator, serial No. 12,705, was stolen from the civil defense office in Burlingame, Calif., on July 1. Notify that office if you know anything about this unit.



Hints and Kinks

For the Experimenter



GRID-DIP OSCILLATOR CALIBRATION AT V.H.F.

SOME of the wide-range g.d.o.s fall off in accuracy at v.h.f. and can vary quite a few megacycles in the 144- and 220-Mc. bands. One method to calibrate the g.d.o. at these frequencies is to place it a few feet away from a TV receiver and tune it until it zero beats the sound portion of the program. The table below shows the sound carrier frequencies of the v.h.f. channels. To prevent erroneous calibration due to images, move the g.d.o. as far as possible from the TV receiver to eliminate any weak false signals. The intervals between channels can be filled in by interpolation using the original g.d.o. dial markings. In the 88- to 108-Mc. range, the same procedure can be used with an f.m. tuner as a receiver.

Channel No.	Sound Carrier (Mc.)
2	59.75
3	65.75
4	71.75
5	81.75
6	87.75
7	179.75
8	185.75
9	191.75
10	197.75
11	203.75
12	209.75
13	213.75

—Samuel M. Bases, K2IUV

SOLDER SPONGE

To reclaim used parts or to remove wires from terminals for modifications, make a solder sponge. This is simply a length of braided wire which has been dipped in liquid flux. The outer braid on any small coaxial cable, such as RG-58/U, makes a good sponge. Use Kester liquid resin flux or make your own by dissolving resin in isopropyl alcohol.

Position the sponge on the terminal and apply a hot soldering iron to the other side of the sponge. When the terminal is hot enough to melt the solder, the solder is literally sucked up into the sponge and leaves a clean terminal with no solder splashes on adjoining circuitry. This method is especially good where stranded wire has been wrapped around tube socket terminals.

WINDOW-GLASS PERFORATOR

WHEN it's necessary to perforate window glass for antenna feedthrough insulators, use a steel BB pellet or small ball bearing and a com-

mon drinking straw. Insert the BB in the straw and, holding the straw about an inch away from the glass, give a hard blow. The pellet will hit and fall back on your side of the glass, while a conical-shaped piece of glass will chip and fall out the other side. The resulting hole is the same as that produced when kids and BB guns are mixed! If a larger hole is needed, it can be reamed to a larger size by careful honing with Carborundum cloth. With a little practice, holes can be placed side by side, an inch apart, without cracking the window pane.

—Dean Miller, W4TRQ/7

PENCIL IRON CLEANER

OWNERS of pencil soldering irons will find the following technique useful in removing excess solder from the tip. The process is also quite effective for removing the oxide that forms on the tip. Plug in the iron and let it come up to temperature. Plunge the hot tip into a bar of sealing wax, then brush the wax off the tip with a stiff bristle brush. Excess solder and oxide will come off with the wax.

—Richard Bezman, K3NGP

FAST MOBILE BAND CHANGING

Is your mobile antenna one of those with the center load coil that has to be changed whenever you change bands? If so, you can save yourself some time, trouble, and expense by having just one standard coil in the center, cut for the highest 80-meter frequency you want to use. To hit the other bands, you merely clip parallel inductances to this coil. W3NF and I worked this out last summer and found it works fine. Although any kind of form will do, we used old Master Mobile coil forms which are about an inch in diameter and kept cutting and trying until we found a point at which the two coils in parallel provided the necessary inductance to load the transmitter on the other bands. We secured the wire on each coil form by giving it a heavy coat of dope or varnish and fastened battery clips to the wire ends so it could be clipped to the main coil.

The loading doesn't change much over the entire band on 40 and 20 meters. On 80 meters, it is necessary to use capacity loading atop the coil to load at frequencies lower than that for which the coil is cut. We found that a good way to do this is to use strips of metal strap held with clips and fastened to the top of the coil. Quite a lot of loading may be required at the low frequency end of 80 meters and it may be necessary to use two straps—otherwise you'll have a mighty long piece of strap flapping around!

—George Hart, W1NJM

AVOIDING CRYSTAL BURNOUT IN THE APX-6

IN the APX-6 follow-up article in February *QST*, a circuit is shown in which the crystal current circuit is broken by the send-receive switch to avoid excessive crystal current. It should be pointed out that this method should be employed only if the t.r. system is adjusted so that the crystal current is quite low. Otherwise, there may be excessive back voltage, which could damage the crystal more readily than high crystal current. A forward current of 10 ma. or so will not bother a 1N25, provided the d.c. resistance of the loop is low, say, under 50 ohms; but a few volts, open circuit, may cause crystal burnout.

A cause of crystal trouble with the APX-6 may be excessive current because of oscillation in the i.f. system. The i.f. will oscillate wildly if operated without its customary shielding, or with any of its loading resistors removed or reduced in value. Mixer crystals available nowadays are more rugged than low-noise vacuum tubes, such as the 416B, as far as damage from excessive transmitter leakage is concerned.

— Henry H. Cross, W100P

VACUUM-TUBE RECTIFIER REPLACEMENTS

W8NOH's tip in "Hints & Kinks," *QST*, January, 1961, was a good one. However, semiconductor diode units are available for exact replacement of common vacuum-tube rectifiers. These rectifier packages are contained in octal-based holders and simply plug in the vacuum-tube rectifier's tube socket. Sarkes Tarzian, Inc., of Bloomington, Indiana, has several replacement types, such as the type S-5018 which replaces the 5U4, the S-5019 for a 5R4, and the S-5130 for an 816 or 866 (10,400 p.i.v., 300 ma.). The semiconductor versions have proved much more reliable and longer-lived than the thermionic vacuum-tube rectifiers and, of course, provide cooler operation and less voltage drop.

— Neil Johnson, W2OLU

BURYING 300-OHM FEED LINE

I WANTED to try out a Windom antenna which requires a 300-ohm feed line. It's not unusual to bury coaxial feed lines, and so I decided to try to bury the 300-ohm line to preserve my neat antenna installation. I used some Homart Flex-O-Pipe, which is a polyethylene pipe designed for underground water lines, and ran the feed line through it. The pipe can be obtained from most Sears Roebuck stores. The $\frac{1}{2}$ -inch size is perfect for either the 300-ohm tubular or flat line. I inserted the feed line into the plastic pipe by first running a No. 12 leader wire through the pipe and then tying the wire to the feed line and pulling them both through. I am using about 60 feet of the underground feed line on 80 through 10 meters with success.

— Floyd Donbar, W8PA

MOUNTING FEET FOR EQUIPMENT

WHILE I was searching for rubber mounting feet for home-built equipment, I came across some small rubber bumpers normally used as commode seat bumpers. They are carried by most hardware stores, average about a dime apiece, and come complete with a recessed screw. The wood screw can be replaced by a machine screw when mounting on a metal cabinet or chassis. The bumpers measure about $\frac{3}{4}$ inch in diameter, $\frac{3}{8}$ inch high and have a $\frac{3}{8}$ -inch hole.

— Warren Rudolph, W4OHM

CONTACT BOUNCE MAY CAUSE KEY CLICKS

IF you are using a semiautomatic key and are receiving reports of bad key clicks, check the adjustment of your "bug." With some high-speed dot adjustments, the dot contact actually bounces and breaks up the first part of the dot into a series of sharp pulses. Some transmitters will attempt to follow these pulses and will exhibit clicks under these conditions. Also, electronic keyers, such as the HA-1 (T.O. Keyer), will attempt to follow poor bug contacts.

— Fritz A. Franke

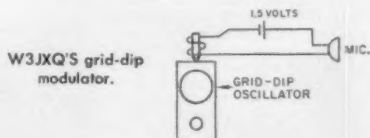
CABLE MARKERS

WIRES and small cables can be conveniently marked with jewelers' ring tags. These are the labels that jewelers use to mark the price of rings and other jewelry. They are available in several styles, including gummed paper and snap-fastening plastic, and come in several colors. The labels can probably be obtained from a jewelry store at no cost since they usually have large numbers of them on hand.

— Merritt F. Malvern, W2ORG

LOOP MODULATOR

ONE of the oldest yet simplest methods of modulation is loop modulation. The prin-



ciple can be used to modulate a grid-dip meter for test purposes, as shown above. The microphone is a carbon type.

— E. Dan Leibensperger, W3JXQ

V.T.V.M. FIELD-STRENGTH METER

TO use a v.t.v.m. as a field-strength meter, set the meter to a low a.c. range and place the test leads in the shape of a dipole. Although most meters fall off in sensitivity in the r.f. range (except, of course, when using an r.f. probe), a relative field-strength reading can usually be obtained by this method.

— Frank Reid, K4VHJ



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

SEPTEMBER starts fall and winter activities rolling again. After languorous summer days, the urge to get back to a more vital, regular routine usually recurs.

As a ham, a YL has open to her the wonderful world of the usual amateur activities. As a YL she has an additional set of activities exclusively hers. YL clubs, nets, certificates, contests, news-sheets, get-togethers a la femme! Opportunities galore — opportunities to learn, to have fun, to be of service.

The season is on. We all have the same 24 hours each day. It's how we use the hours that counts.

Join Up?

Inquiries about the YLRL are always numerous. To enlighten summertime feminine newcomers to the hobby, YLRL has meant the Young Ladies Radio League since 1939, when it was founded as an organization of women amateur radio operators to further cooperation among members, to develop efficiency in radio operating, and to further the interests of amateur radio in general. 1961 finds YLRL restating the same aims and now seeking its 1000th member.

An international organization, YLRL sponsors a variety of popular certificates, contests, and activities. Any licensed woman amateur radio operator is eligible for membership, including novice licensees. Dues are \$2.00 annually, prorated quarterly from March 1 each year. Applications for membership may be obtained from Treasurer Jean Kincheloe, K6QDQ, 6625 N. Brightview Drive, Glendora, California. Doris Anderson, K5BNQ, of Broken Arrow, Oklahoma, is 1961 President.

Ladies Day

The YLRL, through Vice President WIZEN, announces a brand-new activity — "Ladies Day". It's not a contest — there are no prizes — no logs to send — "Ladies Day" will simply be one special day each month when it is hoped that all YLs possible will get on the air and ragchew a while.

OMs should *not* beware. In fact, the activity was concocted with OMs very much in mind, especially those who

*YL Editor, QST: Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.



British Columbian YL VE788B, Eva Green, says that as a YL she seems to be in solitary splendor on 20 c.w. "If the band is good, I just call CQ once and there are Yankee OMs lined up on the frequency for hours, possibly because of my dandy c.w. call". Licensed only since May, Eva already has her 15 w.p.m. Code Proficiency Certificate. Her OM is VE7AGO.

ask, "Where do all of the gals disappear after the YL-OM contest?"

Be available the second Monday of each month, starting with September 1961, and help make "Ladies Day" a gala day.

Howdy Days

For a third year YLRL will sponsor the special activity "Howdy Days" for licensed YLs. "Howdy Days" is a get-acquainted rag-chewing fun party for all YLs who want to start off the fall season right by chatting with old friends and meeting new ones. YLRL Vice President Onie Woodward, WIZEN, suggests that a helping hand be extended to all new YLs by acquainting them with YLRL and its activities, the various YL nets, clubs, etc. Non-YLRL YLs are encouraged to submit logs.

"Howdy Days" start Tuesday, Sept. 26, 1961 at 1700 GMT and will end Thursday, Sept. 28, 1961 at 1700 GMT. Score will be based on licensed YL contacts only. All bands and all modes of emission may be used. Only one contact with each station will be counted. Contacts on nets will not be counted. No multipliers will be used. Score 2 points for each YLRL member worked; 1 point for each non-YLRL YL worked. Logs are not required. Submit a list stating date, time, call, name, QTH, and whether YLRL member or not.

To the top scoring YLRL member will go a choice of pin, charm, or YLRL stationery. The award to the highest scoring non-YLRL YL will be one year paid membership in the YLRL. Score sheets should be submitted to Onie Woodward, WIZEN, 14 Emmett St., Marlboro, Mass. and must be received by WIZEN by October 15, 1961.

New Nets, Clubs, and Awards

A new YLRL affiliated club, the Texas Bluebonnet, will issue a certificate for contact with six members on any band. Officers are Pres. K5TUP and V.P. W5AWG. A weekly net on 50.4 Mc. is scheduled.



Since 1957 members of the Washington Area and the Penn-Jersey YL clubs have been getting together annually. Attending this year's party at The Diplomat in Washington were I. to r. K4EAM, W3GTC, W3RXJ, K3NLU, K4BNG, W3TSC, W3UXU, W3SLF, K3BCI, W3SBE, K3BDN, K4LMB. Not shown but also on hand were W3CDQ and W3AKB. (Photo by W3CDQ)

The Oklahoma Six Meter YL Net meets on the air Thursday at 0100 GMT on 50.250 Mc. and in person the second Friday of each month at different homes. Officers are Pres. K5LRE; Treas. K5INY, and Secy. K5URF. Work three members for a certificate.

The Hoosier Amateur Woman's Klub, in addition to its HAWK certificate, is offering a special HAWK-Eye-Laah award. The award is available to any YL who earns 75 points beginning May 1, 1961. Write custodian Fran Velch, K9ILK, P.O. Box 135, Princeton, Indiana, for details.

Marie Helmski, W8MBI, 3943 Concord St., Toledo, Ohio, has been named custodian of the new Ohio YL award mentioned in last month's column.

Coming Events

Ladies Day—beginning in September, the second Monday of each month. See item this column on this new activity. **ARRL N. Y. State Convention**—Hotel Niagara, Niagara Falls, N. Y., Sept. 15-17. Clara Reger, W2RUF, is planning special YL and XYL programs. See last month's column for further details.

Howdy Days—Sept. 26-28, 1961, sponsored by the YLRL. See rules this column.

YLRL Anniversary Party—the 22nd annual party for all licensed YLs. The c.w. section starts Oct. 25 at 1700 GMT and ends Oct. 26 at 2300 GMT. The phone portion starts Nov. 8 at 1700 GMT and ends Nov. 9 at 2300 GMT. Complete rules this column next month.

TYLRUN Anniversary Party—The seventh anniversary party of the Texas YL Round-Up Net will be celebrated Nov. 4 at Brownfield, Texas. The net, which includes some 170 members from several states, has been extended the invitation to converge at Brownfield by the GABs (Gals at Brownfield), a new YL club. Contact GAB Secy. Irene Lewis, K5LSO, 1004 S. 6th St., Brownfield, Texas.

Lovely Jinny Kahle, K6RQB, whose photo appeared in the July column, was second runner-up in the state finals in the Miss California Beauty Contest. Participating in the contest as Miss Monterey County of California, Jinny won a \$300 scholarship, a savings bond, clothing, jewelry, and assorted gifts. Congratulations, K6RQB!

QST

Strays

If you are looking for an alligator clip to work in a very small space, take a look at the *Micro-gators* offered by Mueller Electric Co. The tip is about the size of the head of a common pin.



Other YLs were present, but the camera caught only K8ARA, Ruth, W4HLF, Arlie, K8BCL, Maxine, and K8AQB, Alice, at the West Virginia Hamfest July 8 and 9 at Jackson's Mill near Weston.



When Evelyn Scott, W6NZP, left, visited Ceylon on her last international safari, she was met and entertained by well-known Asian YL Soma Wickremasinghe, 4SYL. For a number of years Soma has afforded countless contacts to U. S. (and other) hams seeking an Asia YL for the WAC-YL award. (Photo courtesy Harold Scott)



Ten year-old KN1SDM, Dorothy Barnes, hopes to get her general class ticket following a radio study session at Camp Albert Butler in No. Carolina in August. (See May '61 QST for article on Camp Butler.) Dorothy, who is a member of the Camp Fire Girls in Sutton, Mass., has a 10 w.p.m. Code Proficiency Certificate.

The World Above 50 Mc.

150-1500 2500-2450 3500-3500 5550-5925 10,000-13,500 21,000-22,000 30,000-?

CONDUCTED BY SAM HARRIS,* W1FZJ

Sporadic E on 144 Mc.?

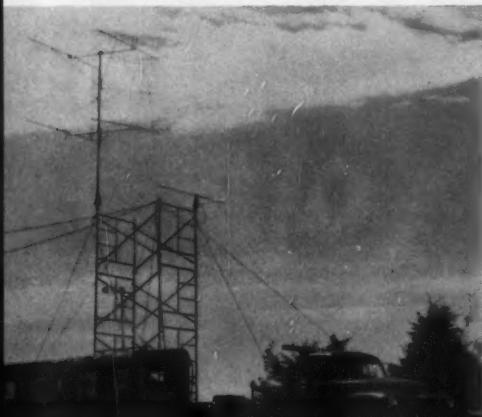
THE fond hope of 144-Mc. DXers has always been to participate in an *E*_s opening on their favorite frequency. The unprecedented 50-Mc. *E*_s openings of this year have had all the senior 144-Mc. boys monitoring both bands in hopes of catching 144 Mc. with its *E*_s showing. To date this year there have been two reported possible openings. The first occurred on June 19. W1AJR had been monitoring 50 Mc. for signs of extremely short skip. At 2400 GMT Andy heard Michigan stations working into West Virginia and Indiana stations working into Pennsylvania. At this point he started calling CQ on 144 Mc. and at 0010 GMT was answered by K9AAJ of Quincy, Illinois. Contact was initiated on A1 and completed on A3. Signals were in the 5 5 9 to 5 7 9 area on c.w. with A3 reports running 5 7. K9AAJ had his beam heading northwest when he first heard W1AJR calling CQ DX and almost ignored it thinking it was 14-Mc. i.f. feed through. The QSO lasted about three minutes before signals faded out. No other DX signals were heard on either end and a recheck on 50 Mc. by W1AJR disclosed that the skip had lengthened out. No new state or distance for either station but a very possible "first" *E*_s contact on 144 Mc. between the 1st and the 9th call areas.

On July 10, 1961, a very wide-spread opening existed between the Ohio, Michigan, VE3 area and the Texas, Wyoming, Colorado area. W8KAY was checking 50 Mc. for signs of short skip and observed that *E*_s was very intense but heard no short skip at his location. However, Art did hear evidence of short-hop *E*_s in that some Louisiana stations were calling Indiana. (Note the parallel with W1AJR who also heard no short skip on his end but heard signs of it on the other end.) Art fired up his A1 CQ tape on 144.3 and was rewarded with an answer from W5LUU

* P. O. Box 334, Medfield, Mass.

(144.171) at 2337 GMT. Signals were S9 with some QSB on both A1 and A3. Contact was maintained for 8 minutes; however, W5LUU was still coming in an hour later. At 0040 GMT contact was established with W5BEB (144.126) who was using s.s.b. At 0112 GMT W5MJD was contacted with 5 9 9 signals both ways. Very little QSB noted. At 0249 GMT heard K0AYK (144.090) on A3 peaking S8 with bad QSB. (K0AYK running 10 watts.) No other Colorado stations heard although looking for W0IC (144.103) and W0MOX (144.060). W8CWA (Walt, W8SQU operating) contacted W5LUU at 2348 GMT with 5 9 A3 signals both ways. Ed (W8SQU) also contacted W5MJD at 0120 GMT but signals faded out after one transmission. K7HKD, Cheyenne, Wyoming, contacted W9AAG, W9OAG and W8TYY between 0243 and 0253 GMT. Meanwhile, W0IC, W0MOX and K0AYK were all heard in Michigan by W8YIO. W0MOX reports working W8BPG on A3 but signals faded before he could establish contact with anyone else. W0IC contacted VE3DSU on A1 as well as W8YIO. The Texas stations were heard and worked in western New Jersey by K2LVR (140.080) and K2KVN and as far west as Central Ohio (W8TYY, Columbus). No opening to Texas reported from Michigan or west. The Colorado and Wyoming signals were reported as far east as eastern Ohio and were heard by W4HJQ in Glendale, Kentucky. Indiana and eastern Illinois marked the most westerly reports for the 0's and 7's.

The W1AJR/K9AAJ contact has all the earmarks of an *E*_s contact. There were no weather fronts showing possible tropo openings and the brief sporadic nature of the contact sounds very much as one would expect 144-Mc. *E*_s to behave. The July 10 opening is open to argument. A cold front approaching from Canada and extending East from Wyoming toward the Lake Michigan area could possibly account for the W0, W7 to W8, W9 opening. The Texas to Lake Erie opening had no weather indications and the absence of in-between reports would seem to support an *E*_s sponsored opening. In any event it was a great night for the "Scheduleers".



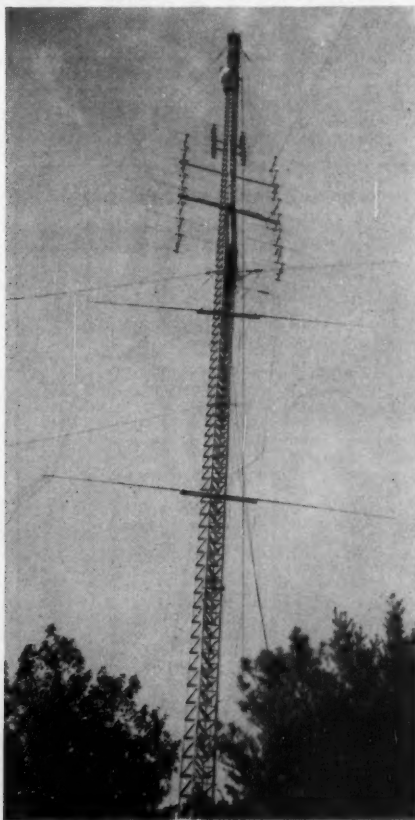
June Contest, W1MHL Style. 144 Mc. setup atop Pack Monadnock, New Hampshire.

QST for

Here and there on 6 and 2

At the present writing conditions on 50 Mc. are still "away out there!" DX, Skip, Sporadic E, Double Hop, are all part of the every day vocabulary of the amateur operating on 50 Mc. at this time. Once again KL7FLC will be in operation beginning on July 25 or thereabouts; this time from a new ice island called Arlis Two which is drifting westward about 130 miles north of Point Barrow, Alaska. Carl Milner, W1FVY, who will join the operation in September, advises that the gang plans to run a 6N2 Thunderbolt into a single or stacked 5-element beam, operating on 50.04 Mc. with an automatic keyer. Operating schedules not set as yet, but general advice to state-side operators is to attempt to hear them plus or minus an hour from local midnight. They will operate on the hours for 15 minutes and then listen. Alternatively, they may run the keyer continuously with only short breaks to listen at random intervals. Receiving setup will be a Tapetone converter into a Collins 51J-3. Any reception or two-way work should be reported to ARRL at once. Two-meter skeds can be arranged by contacting W1RQU.

Direct report from K3MJV/VO2 sez: "On July 15 the six-meter band opened to the New England states at 1715 GMT, and again on July 16 at 0210 GMT. The first opening lasted only twenty minutes and the second lasted two hours and thirty minutes to the same area. I have been up here in VO2 land for a period of eighteen months and to my knowledge this is the first time I have ever seen such a band opening. My equipment consists of a Gonset Communicator III, Model 3136, a four-element wide-spaced beam elevated approximately 30 feet. I used an Argonne AR54 crystal mike and also an antenna rotator. I monitor 50.2 each eve-



144-Mc. beam on the way up at W1BU.



W1QXX and K1ISR at the 144-Mc. operating position on Pack Monadnock during the June V.H.F. Contest

ning and on Saturday and Sunday during the day. At present I am the only ham operator on six meters."

"My total number of contacts were 52, one of which was a VE3." Not having been around at the time of these openings, we're not sure of those who worked K3MJV/VO2, but by diligent listening on 50 Mc. did pick up the fact that he has worked by K1GCU, W1QXX and W1ELP, here in Massachusetts.

More news from the North was received from Mike, VE1ADH. VE1ADH is running one watt output to a 5-element beam. VE2AIO is hoping to be back on six meters for the September contest after being out of commission due to changing QTH. Geoff did manage to string up a 100-foot long wire to listen on and sez it was a mistake 'cause then he found out just what he was missing. Sounded like 20 meters, he opined! And he has copied all U.S. and Canadian call areas except VE7. Geoff also mentions several auroral openings the best of which was on July 4 when he copied VE8BY, VE4CV, VE4YW, and VE4TX. Also says he heard W1BU working VE8BY. One of the many "wanted" call areas is VE5 and this month we hear from VE5GI who reports June openings from June 5 to June 25 inclusive. During this period Graham worked Ohio, Indiana, Illinois, Wisconsin, Colorado, British Columbia, Washington, Oregon, California, New Mexico, Michigan and Florida. A nice total for that period of time and our congratulations to Graham for his tenacity and success. Graham also sez that VE5GG is also still active on 50 Mc. running 50 watts into a two-element beam. Total for VE5GI is 20 states and British Columbia. K1CXX relates that on May 28 at 2115, K1HAV of West Gardner, Maine, worked VE6MO in Viking, Alberta, Canada. Dick (K1CXX) tells of the skip stations he worked during the June contest and later—California, Arizona, Texas and New Mexico; all of which he worked while operating at approximately 50 Mc. Jim, WA6KVS, of Redondo Beach, California, mentions that during the two-day contest period in June he heard all call areas plus VE3, VE7, KL7 and XE1. Another "rare one" to look for is KG1FR in Greenland. According to K8NEY, KG1FR will be operating at 50.8 Mc. on Mondays, Wednesdays and Saturdays at 2400 GMT and on Saturdays at 1300 GMT also. "Ave" will be there until next Spring. George (K8NEY) has been working into VE-land during the recent openings, having worked VE1ABL/1, VE2AOM, VE3RM, VE4YW and VE8BY; and sez the XE1OE, KP4AAN and TI2NA have all been "boiling into Michigan."

Information from W3HFY via W1HDQ indicates that he has worked 180 stations on 2-way a.s.b. using 50, 144 and 220 Mc. K9YIA notes that an a.s.b. net is in operation in the Indianapolis area on 50.110 Mc. Also, Jim is compiling a directory for v.h.f. a.s.b. If you are interested in a.s.b. please send a letter or postal card to: James F. Bamburgher, 6021 East 42nd Street, Indianapolis, Indiana. Include schedules, if any, frequency of operation, and pertinent data on local a.s.b. nets. K6HCP worked W8SGX and W8KCP, all on a.s.b. on June 4 on sporadic E; Ken also worked WA2BPE on a.s.b. on June 17. Lots of a.s.b. activity all over



"Friendship Award" offered by the Sandia Base Radio Club for working five Albuquerque stations on the high frequencies.

the country, sees Ken, K4UMK in Roanoke, Virginia, is another very active 50-Mc. s.a.b. addict, who mentions working into Florida, California, Alabama, Arkansas, Texas, Iowa, Wisconsin and Manitoba, all on s.a.b. Many of these contacts were 2-way s.a.b. Bob also mentions that W4MWD, K4KZX, K4HFP, K4YDG and K4KLC in his area are all to be found operating six meters. K8NEY sees that s.a.b. signals on six are on the increase and are getting through long after the a.m. has faded; he also reports that W5AKW is looking for six-meter RTTY skip contact.

During the recent "out-of-this-world" skip conditions on six meters, many of the gang have finally managed to get their 48th states. In last month's column we mentioned that W3TIF, Doc Varner, got his when he worked W7JRG in Montana. Doc has been operating on 50 Mc. since 1949. Another of the success stories comes true for Bill Coburn, W1ELP (who has been operating the band since the five meter days), when he worked New Mexico in June. We have it (through the grapevine) that the entire amateur population of Johnstown, Pennsylvania, is cheering right along with Doc 'cause he finally made it, and they're wondering mightily just what his next goal will be. W1ELP and all New England are cheering for his "Worked 48", but Bill has so many different interests concerning v.h.f. that we're also wondering just which one he'll work at the hardest. Undoubtedly there are many more of the gang who now have that big "48" but these two are the only ones on whom we have first hand information.

From Birmingham, Alabama, George, K4FHU, gives us a blow by blow description of skip conditions during the last half of June. June 16—open to Florida and New England. June 18—pipe line into Minnesota. June 19—open to Virginia, Ohio, Washington, Oregon, Colorado. June 22—Open into New York, Pennsylvania and Massachusetts. June 23—Open into Texas. June 26—New Mexico, New Hampshire, Massachusetts, Pennsylvania. June 27—Mass., New York, Pennsylvania, New Jersey, Indiana, Ohio, Texas, Missouri, Oklahoma. June 28—Puerto Rico, Cuba and Costa Rica. June 29—Mexico, Michigan, New Jersey, Massachusetts and Texas. June 30—A mobile station in New Mexico coming through into Birmingham; K4FHU heard a Florida station working into Idaho.

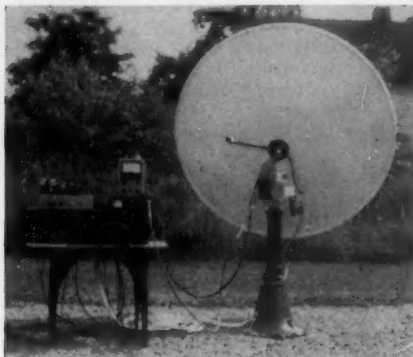
Maine reports through K1HKL that there is lots of local activity now in southern Maine, due to vacationers going

portable there. Not much activity on two meters, however. Don also sees there were excellent openings into Maine on June 10 and 13 when he was hearing 4's, 9's, 8's and one 6. K1NTX reports meeting K4GLC, K4EEL and W4ALI while visiting the State of Virginia. Roy also says there are many local stations on both six and two meters in his local area (Greenwich, Conn.), with K1NUT (poor fellow, what a ribbing he must get) packing a real signal on two meters with a Seneca and 5 element beam. K1JLF puts in the best mobile signal heard on two meters using a Heathkit "Twoer" and home-brew turnstile antenna. From the Hartford, Conn. area, W1FVV sends us his report of the openings during June. Al heard 4's, 9's, 8's, VO1AE and VE4CV during this period, and worked W4FAB, Georgia, for state #27. Sorry to hear that Al and his 142 Mc. gear have parted company and he is now operating 50 Mc. only. "Wha' happen!" K1KKS in Lexington, Mass., reports that he has fixed up his six-meter transmitter for c.w. operation. Wonder if that has anything to do with the fact that he worked Maine during the v.h.f. QSO Party for state #23 on six. Harvey gives his skip report for the dates of June 4, 5, 8, 10, 11, 17, 25 and 27, with most call areas being heard on June 4 when he heard 4's, 8's, 9's, 8's, VO1 and VE1. From Norwood, New Jersey, Fred, W42HFI sees that he worked "Skip" (popular fellow) on twenty days during the month of June, but heard it even more frequently than that; and that he worked thirty-three states during the same period. W42BDP, also New Jersey, reports hearing 26 states during June and also XE1OE, VO1AE and VO1DW during June. Ken reports the best opening as June 29 when he heard W7RUC and K7UTB. Wish we had room to print the entire letter received from W4VRV in South Carolina, but you know how that goes. Lewis wrote a three-page letter full of all kinds of information, hints, etc., but we'll only be able to impart a portion of the letter. "This has been one heck of a month for propagation. Called our first CQ on six meters on June 1 and have been up to the ears ever since." Lew says that after getting his receiver in shape and listening on 50 Mc. he found that South Carolina is a rare state for some and that some of them don't mind how they go about getting it. "A station that sits right slap on top of a station I'm working and calls 'CQ South Carolina' is being a bit too

220- and 420-Mc. STANDINGS

220 Mc.			420 Mc.		
W1AJR	11	480	W9EQC	11	5 740
W1AZK	9	412	W1JCS	9	2 340
W1BDQ	11	450	W9EVL	6	3 475
W1OOP	12	4 400	W9UJD	4	4 605
W1RFU	15	5 480	W9ZIG	10	5 500
W1UHE	11	4 385	K8DGU	5	3 425
W2AOC	13	5 450	K9ITF	6	3 515
K2AXC	8	3 230	K1HUK	1	1 2540
K2CBA	6	650	VE5AB	4	4 450
K2DIG	4	3 140			
W2DWJ	15	6 740			
W2DZA	12	5 410	W1AJR	10	4 410
K2KIB	12	4 300	W1HJQ	8	3 210
W2LRL	10	4 250	W1MFT	8	3 170
W2LWI	12	4 400	W1OOP	11	3 390
W2NTY	12	5 300	W1RFU	7	4 410
K2PTZ	11	4 190	W1UHE	6	4 430
K2QQQ	13	5 540	W2AOD	6	4 290
W2SEU	4	2 150	W2BLV	12	5 360
K2UUR	4	3 105	K2CBA	5	3 225
W2AHQ	4	3 180	W2DWJ	10	4 196
W3FEY	10	5 350	W2DZA	5	3 130
W3JYL	8	4 295	K2KIB	4	2 100
W3JZE	4	3 250	W2NTY	3	2 296
W3KKN	10	4 255	W2OTA	9	3 200
W3LCC	8	5 300	K2UUR	7	3 175
W3LZD	15	5 425	K3EOP	6	3 250
W3UUE	9	5 450	W3FEY	7	3 296
W3UJG	13	5 400	W3RUE	2	4 96
W3ZRF	5	4 112	W4HHK	5	4 550
K4TUE	8	4 400	W4YVR	6	4 450
W4TLC	4	1 165	W5HTZ	3	2 400
W4UYB	7	5 320	W5RCL	9	3 600
W5AJG	3	2 1050	W6GTG	1	1 180
W5RCL	8	5 700	W7LRL	2	1 180
K6GTG	2	1 240	W8HCC	3	2 355
W6MMU	2	2 225	W8HRC	3	2 250
W6NLZ	3	2 2540	W8JLQ	4	2 275
K7CWC	1	2 250	W8NRM	3	2 390
K8AXU	10	5 1050	W8PT	5	3 310
W8LJG	9	5 475	W8RQI	4	2 270
W8LPD	6	4 480	W8TNY	7	3 580
W8NRM	8	4 390	W8UST	3	2 255
W8PT	10	5 660	W9GAB	9	1 608
W8SVI	6	4 520	W9AAG	5	3 375
W9AAG	9	6 600	W9OJL	6	3 330

The figures after each call refer to states, call areas and mileage of best DX.



1296-Mc. listening antenna at W8CAZ.

obvious about it, and goes on the you-know-what list, at least for that day. I still think that this type of operator is only a small percentage of the 50-Mc. operators but they surely can make life miserable if you think, as I do, that a QSO should consist of more than Name, Rank, and Serial Number." Another hint from Lew - notation of "Return postage guaranteed" on the address side of your QSL will bring back the cards that have gone astray - and the sender can then look up the address in the proper call book. During the period from June 1 to July 3, Lew heard (and wrote most of) thirty states plus CO2BG, VE3ETO and VE1BC, George, K4JFV, Knoxville, Tennessee, mentions that on July 11 he worked K3KEO and W3DUL for the states of Maryland and Delaware for the last two needed on the East Coast. Bill, W4WGI, Huntsville, Ala., reports openings as follows: Upper east coast on June 15, 16, 17 and 25; mid-west, June 4, 12, 20, 26, 27; west coast, June 9; lower east coast, June 26. W5UQR in Louisiana, sez: "Sporadic E propagation this summer, to my knowledge, has had no equal in the 2½ years I've been on six meters. The band has been open almost every day since the first of May. The lower Mc. on six sounds like 20 meters on a week end." K6KLY screams for "help", saying the band is open in his area (during June) for two out of three days. What he's screaming for is more power and more sleep. I know what he means by wanting more power but golly, who needs sleep when 50 Mc. is open! Run says that during June he has heard the entire U. S., Puerto Rico and Canada; and during the June Contest worked 26 states and three countries from atop Mt. Diablo. K6SIX in Los Angeles reports same conditions but sez that the QRM is so-o-o bad that he'd rather read the mail than fight. Aw c'mon Les, where's that old 50-Mc. fightin' spirit? A good comment from Gib, W6BJI: "Who needs P2?" In the spring of 1960 Gib copied some RTTY stations which were identified as coming from Wake, etc. On July 6 this year, he heard the same type of signals coming in and says "If this is E, it is 5- or 6-hop stuff! W5SFW was hearing it at the same time in Amarillo; that would mean five hops to me - six to Phil!" We mentioned earlier in this column that W7JRG was #48 for W3TIF - Now, we hear from Ken that he has been #48 for three stations to his knowledge - 1st was Ed Tilton, WHDQ, back in 1952; 2nd was Doc Farrar, W1CL8 in 1957; 3rd was Doc W3TIF in 1961. Ken says he still needs Vermont, Delaware and West Virginia; he has worked Alaska and Hawaii, but not as states. Must be quite a thrill to be "that last one needed", but WIHOY gets almost as big a kick out of being the "first in Massachusetts" for skip stations. Only report from Washington received from K7BBO, Tacoma, who says June was a real good month on 6 with 1's, 2's, 4's, 5's, 6's, 8's and 9's coming in almost every day. K8BGZ worked W1EXZ and K1BUH in Vermont for state #45 during the contest, and on June 19 worked K3EBB in Delaware for State #46. From Jackson, Michigan, W8BAN tells us that he worked XEIOE and YE8BY; but most important of all - Walt's eldest boy, Bill, received his ticket and is now W8ARL. (He must have had pull!) Competition is high at that QTH now, what with Walt, Bill and Walt's XYL, K8YKW, Emma, all fighting for the 6 and

2 meter rig. Wichita, Kansas, and Dot Hall, K9GIC sez that double hop was observed on June 2, 8, 10, 11, and 29; and that XEIOE was in on June 5, 9, 10, and 28 with 5-9 signals. Dot also comments that Ed Tilton, WHDQ, gave a very interesting talk to the local ham club on June 7. (That boy sure is getting around lately!)

Clubs and Nets

The 6 Meter Club of Dallas, during the State Fairs of Texas in 1959 and 1960, had an exhibit set up in a public place. This exhibit was set up on one day only and this day was designated as "Amateur Radio Day" by the State Fair (Continued on page 138)

2-METER STANDINGS

WIREZ	32	8	1300	W6WSQ	15	5	1390
WIAZK	28	8	1205	W6NLZ	12	5	2540
WIKCS	24	7	1150	W6DNG	9	5	1040
WIRFU	24	7	1120	W6AJF	6	3	800
WIAJR	23	7	1130	W6ZL	5	7	1000
WIHDQ	22	6	1020	K6HMS	4	3	850
WIMMN	21	7	1090	K6GTG	4	2	800
WIZY	20	7	1180	W6MMU	3	2	950
KICRO	19	6	800				
WIAFO	18	6	920	K7HKD	13	5	1130
KIAFR	17	5	450	W7JRG	12	4	1040
				W7JCM	5	2	670
W2NLY	37	8	1390	W7LHL	4	2	1050
W2CXY	37	8	1360	W7JJP	4	2	900
W2ORI	37	8	1320	W7UJ	4	2	235
W2GOL	33	8	1200				
W2BLV	30	8	1020	W8KAY	38	8	1245
W2AZL	29	8	1050	W8SDJ	37	8	1260
K2IEJ	27	8	1060	W8PT	37	8	1350
K2LMG	25	8	1160	W8IFX	35	8	980
W2AMJ	25	6	960	W8SFG	34	8	1040
K2VIE	23	8	1200	W8LOF	33	8	1060
K2DWJ	23	6	860	W8RMH	32	6	910
K2HOD	23	7	950	W8GGH	32	8	1180
W2PAP	23	6	753	W8HAX	32	8	960
W2AIR	23	8	980	W8NQH	32	8	1020
W2RXG	23	8	1200	W8SVI	30	8	1080
W28MX	23	7	1090	W8EHW	30	8	860
W2LWL	21	6	700	K8AXU	29	8	1050
K2KIB	21	5	900	W8LPI	29	8	850
W2ESL	21	6	750	W8WRN	28	8	680
W2WZR	19	7	1040	W8DC	26	8	720
W2TTH	19	7	850	W8ILC	25	8	800
W2RGR	19	8	720	W8JWJ	25	8	940
K2RLG	17	6	980	W8WNM	25	8	900
				W8GFN	23	8	540
W3RUE	33	8	1100	W8LCY	22	7	680
W3GKP	31	8	1180	W8BLN	21	7	610
W38GA	31	8	1070	W8GTR	17	7	550
W3TDF	30	8	1125	W8NRM	17	7	550
W3KCA	28	8	1110				
W3BYE	28	8	1070	W9KLR	41	9	1160
W3EPH	22	8	1000	W9WOK	40	9	1170
W3LNA	21	7	720	W9GAB	34	9	1075
W3NKM	20	7	730	W9AAG	33	8	1050
W3LZD	20	7	650	W9REM	31	8	850
				W9ZIH	30	8	820
W4HJQ	38	8	1150	K9AAJ	29	8	1070
W4HHK	37	9	1280	W9PBI	28	8	820
W4ZXL	34	8	950	W9LVC	27	8	950
W4LTV	34	8	1160	W9EQE	27	8	820
W4MKJ	33	8	1149	W9OJL	27	8	910
W4AO	30	8	1120	W9ZHL	25	8	700
W4VLA	26	8	1000	W9BPP	25	7	1030
W4EQM	25	8	1040	K9AGP	24	7	960
W8AIB	25	8	900	W9LF	22	7	825
W4WNH	24	8	850	W9KPS	22	7	690
K4EUS	24	6	765	W9CLX	21	7	800
W4JCJ	23	6	725	W9PMN	19	6	800
W4VVE	22	6	720	W9ALU	18	7	800
W4RMU	21	7	1080	W9BFB	37	9	1350
W4TLY	20	7	1000	W9PHD	31	8	1030
W4IKV	20	6	720	W9SMJ	29	9	1075
W4OLK	20	6	720	W9LFE	28	7	1050
K4VIE	18	8	830	W9QDH	27	9	1300
W4LNC	18	7	1080	W9BUT	27	6	900
W4RFR	18	9	820	W9INI	21	6	830
W4CFZ	18	6	650	W9TGC	21	7	870
W4MDA	17	6	750	W9BYG	19	7	825
				W9IC	19	7	1245
W5RCI	35	9	1215	W9MOX	19	6	1150
W5AJG	30	9	1360	W9JAS	18	6	1130
W5WAT	29	7	1150	W9AGT	18	8	1200
W5DFU	28	9	1300	K9AQJ	16	6	1120
W5PZ	27	8	1300	W9IFS	16	6	1100
W5LPG	25	7	1000				
W5FYZ	26	9	1160	VE3DIR	30	8	1330
W5KTD	23	8	1200	VE3AIR	28	8	1340
W5ML	16	5	700	VE3BQN	19	7	790
W5PFI	12	5	1390	VE3AGT	18	8	1200
W5HEZ	12	5	1250	VE3DER	17	8	1340
W5CVW	11	5	1180	VE3HW	17	7	715
W5NDE	11	5	625	VE3RPE	14	6	715
W5VY	10	3	1200	VE2ABE	10	4	580
W58WV	10	3	600	VE7FJ	2	1	365
W5YVO	7	4	1330				
W5UNH	6	3	1200	KH6UK	1	22	2540

The figures after each call refer to states, call areas, and mileage of best DX.

Happenings of the Month

Election Notice

FCC Dockets Adopted

FAA Tower Rules

ELECTION NOTICE

To All Full Members of The American Radio Relay League Residing in the Atlantic, Canadian, Dakota, Delta, Great Lakes, Midwest, Pacific and Southeastern Divisions:

An election is about to be held in each of the above-mentioned divisions to choose both a director and a vice-director for the 1962-1963 term. These elections constitute an important part of the machinery of self-government of ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. The election procedures are specified in the By-Laws. A copy of the recently-revised Articles of Association and By-Laws will be mailed to any member upon request.

Nomination is by petition, which must reach the Headquarters by noon of September 20. Nominating petitions are hereby solicited. Ten or more Full Members of the League residing in any one of the above-named divisions may join in nominating any eligible Full Member residing in that division as a candidate for director therefrom, or as a candidate for vice-director therefrom. No person may simultaneously be a candidate for both offices; if petitions are received naming the same candidate for both offices, his nomination will be deemed for director only and his nomination for vice-director will be void. Inasmuch as all the powers of the director are transferred to the vice-director in the event of the director's resignation or death or inability to perform his duties, it is of great importance to name a candidate for vice-director as it is for director. The following form for nomination is suggested:

Executive Committee

The American Radio Relay League
West Hartford 7, Conn.

We, the undersigned Full Members of the ARRL residing in the Division, hereby nominate of as a candidate for director; and we also nominate of as a candidate for vice-director; from this division for the 1962-1963 term.

(Signatures and addresses)

The signers must be Full Members in good standing. The nominee must be a Full Member and the holder of at least a General Class amateur license, or a Canadian Advanced Amateur Certificate and must have been a member of the League for a continuous term of at least four years at the time of his election. No person is eligible who is commercially engaged in the manufacture, sale or rental of radio apparatus capable of being used in radio communications, or is commercially engaged in the publication of radio literature intended in whole or in part for consumption by radio amateurs.

All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon EDT of the 20th day of September, 1961. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of vice-director. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are occasionally found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director and for vice-director but members are urged to interest themselves equally in the two offices.

League members are classified as Full Members and Associate Members. Only those possessing Full Membership may nominate candidates or stand as candidates; members holding Associate Membership are not eligible to either function.

Voting by ballots mailed to each Full Member will take place between October 1 and November 20, except that if on September 20 only one eligible candidate has been nominated, he will be declared elected.

Present directors and vice-directors for these divisions are: *Atlantic*: Gilbert L. Crossley, W3YA, and Edwin S. Van Deusen, W3ECP. *Canadian*: Noel B. Eaton, VE3CJ (vice-directorship vacant). *Dakota*: Charles G. Compton, W0BUO, and Martha J. Shirley, W0ZWL. *Delta*: Sanford B. DeHart, W4RRV, and Victor Canfield, W5BSR. *Great Lakes*: Dana E. Cartwright, W8UPB, and Robert B. Cooper, W8AQA. *Midwest*: Robert W. Denniston, W0NWX, and Sumner H. Foster, W0GQ. *Pacific*: Harry M. Engwicht, W6HC, and Ronald G. Martin, W6ZF. *Southeastern*: James P. Born, W4ZD, and Thomas M. Moss, W4HYW.

Full Members are urged to take the initiative and to file nominating petitions immediately.

For the Board of Directors:

JOHN HUNTOON
Secretary

July 1, 1961

FCC LICENSING NOTES

In the first six months of 1961, FCC has received about 70,000 applications for new, re-

The Chicago Area Radio Club Council installed two complete amateur stations for the International Trade Fair held in Chicago July 25 to August 10, and thereby enlightened thousands of visitors concerning ham radio's public service. The CARCC's call, W9TEM, was used for the stations, which used all modes and all bands 80 through 10 meters and handled message traffic to servicemen overseas. Special QSLs will be issued to the stations working W9TEM at the Fair.

QST for



newed, modified or duplicate amateur licenses, compared with a normal load of 100,000 for an entire year. As a result, FCC is badly behind in processing amateur license applications, the delay often amounting to more than 70 days. Preferential attention is being given to new applications with renewals and modifications taking a back seat.

If you are waiting for a renewal or modified license, please be patient: letters asking the Commission to trace applications only add more work and further delay the processing of the licenses. If your application for renewal was submitted so that it reached the FCC office before expiration, you may continue operating until your new ticket arrives. Likewise, if you have submitted a change of address to FCC in Washington, and have notified the District Engineer-in-Charge of the district in which you now live you may operate under the rules for portable stations until the modified license arrives.

In this column in the May issue, we reported that the Commission had started issuing WN4 licenses to Novices, which would be converted to WA4 calls upon the issuance of a higher class of license. In July the FCC started to issue WN/WA calls in the fifth, eighth, ninth, and tenth call areas as well, feeling that the WN prefix is more readily associated with a Novice than the WV prefix being used in the second and sixth areas. Don't be alarmed, therefore, if you should hear a WN with the same number and same three letters you have.

FAA TOWER RULES

The Federal Aviation Agency has adopted new rules covering structures which may constitute hazards to air navigation, and has now assumed jurisdiction over radio-tower and antenna hazards, heretofore regulated by FCC. The new rules are complex in their possible application to amateur towers in the vicinity of airports, but in general produce the same limitations as are now embodied in Section 12.60 of FCC's amateur rules.

Additionally, the new rules provide that ordination through FAA is not required for a tower near an airport when it is "shielded by existing structures of a permanent and substantial character or by natural terrain or topographic features of equal or greater height."

Any amateur within a few miles of an airport contemplating construction of a tower of considerable height, not "shielded" as described above, should obtain a copy of Part 626 of FAA regulations to determine whether he is affected.

LICENSE SUSPENSIONS

The FCC has suspended for one year the Advanced Class amateur license of Francis M. Sarver, W6AOR, of Van Nuys, California. The licensee was found to have transmitted communications containing obscene, indecent or profane words, language or meaning on at least two occasions. The suspension was effective on July 11, 1961, no hearing having been requested. [Section 303 m (1) (D) of the Communications Act; Section 12.157 of the Rules Governing the Amateur Radio Service]

The Technician Class license of Robert George Minger, K6BAL, of Fresno, California, was suspended for one year, for infractions of the rules which took place in the Class D citizens band. FCC found that Mr. Minger had transmitted communications containing profane or obscene words, language or meaning; had knowingly transmitted false or deceptive signals or communications; and had knowingly transmitted a call sign which was not assigned by proper authority to the station he was operating. The uncontested suspension went into effect on July 21, 1961. [Section 303 m (1) (D) of the Act; Sections 12.157 and 12.158 of the Rules.]

The Commission also suspended the license of Phoenix Whitson Brown, KN9ZKW, of Evansville, Indiana, for attempting to secure a Conditional Class license through fraudulent means. Papers submitted to the Commission by the amateur purported to show that he had taken the code test before a stated volunteer code examiner which was not true. The suspension, not contested, was for the remainder of the license term (that is, until July 19, 1961) and went into effect on July 9, 1961. Although FCC did not catch up with Mr. Brown until nearly the end of the license term, and thus the amateur lost only ten days of potential operation, this suspension will appear permanently on the Commission's records, and will undoubtedly be taken into consideration should Mr. Brown apply for any other amateur license in the future. [Sections 303 m (1) (A) and (F) of the Act; Section 12.162 of the Rules.]

Lt. General Francis H. Griswold (Butch), K0DWC, delivered the commencement address at The New York Institute for the Education of the Blind, 999 Pelham Parkway, New York, N. Y. Theme of General Griswold's address was "Peace Through Strength in America". Five licensed hams attend the Institute. In the photograph, Rudy Wachter, WA2NSR; Jimmy Geoghegan, WA2GMV; General Griswold, K0DWC; and Bob Gunderson, W2JIO, Editor of the Braille Technical Press, gather around the code table in the new radio lab at the Institute.



Dr. Lee De Forest

It is with deep regret that *QST* must record the passing of another of the great pioneers in radio. Dr. Lee De Forest, the holder of over three hundred patents in wireless telegraphy, radio-telephone, wire telephone, sound-on-film talking pictures, high speed facsimile and picture transmission, and television, died in his home in California on June 30, 1961. Dr. De Forest is perhaps best known for his invention of the three-element audion tube which opened the way to modern communications and achieved for him the name "The Father of Radio."

Lee De Forest was born in Council Bluffs, Iowa, on August 26, 1873. His earliest work was in the field of wireless telegraphy. (He recently explained, however, that since his code speed never exceeded 15 words per minute his ambition was to develop radio telephone.) Between 1903 and 1906 Dr. De Forest developed the audion tube, the key to modern communications. In succeeding years he improved the tube and devised audio and r.f. amplifiers. Never one to retire, he carried on experiments in his California laboratory until failing health caused him to close it in his 85th year. He maintained an office right up to his death. De Forest was never a licensed amateur himself, but he always expressed a kinship for amateurs, and his own approach to engineering problems was often as full of enthusiasm and the cut-and-try spirit as that of members of our fraternity.

FCC OKAYS CONDITIONALS OVERSEAS

The FCC has adopted in essence the rules changes proposed in Docket 14,025. Effective September 6, 1961, American citizens living outside the U. S. for a temporary period of a year or more may apply for Conditional Class licenses whether or not their permanent address is more than 75 miles from an FCC examining point. The text of the Report and Order follows:

Before the FEDERAL COMMUNICATIONS COMMISSION Washington 25, D. C.

In the Matter of
Sections 12.21(d) and 12.44(a) of
Part 12, Rules governing amateur
radio regarding eligibility for Con-
ditional Class licenses. } DOCKET NO. 14025

REPORT AND ORDER

By the Commission: Commissioners Hyde and Lee absent.

1. The Commission has considered the comments filed in the above-entitled matter as a result of the issuance of a Notice of Proposed Rule Making (26 FR 2875) April 6, 1961. The proposed rule amendments would permit an applicant residing temporarily outside the United States to take an examination for a Conditional Class license even if

his residence in the United States is less than 75 miles from a legal Commission examination point.

2. Three comments were received in this proceeding, all favoring the proposed change. Two were from amateur radio clubs located in the Panama Canal Zone, while the third was from the American Radio Relay League which had submitted the original petition in this matter. The filings express the opinion that should these rule changes be adopted many American citizens forced by work or study to reside outside the United States will be able to operate in the foreign countries where they are temporarily residing once they obtain a United States amateur radio station license.

3. The Notice of Proposed Rule Making discussed the question of what should constitute a reasonable period of residence outside the United States and proposed therein that the Rules should require that this tenure be for at least twelve months. The Commission will permit applicants who have been, or will be, residing outside the United States for this twelve-month period to take the Conditional Class examination provided, of course, adequate evidence of such residence is presented. What will constitute sufficient evidence will be determined from the particular facts in each case.

4. Authority for the amendments set forth in the attached Appendix is contained in Section 4(i) and 303 of the Communications Act of 1934, as amended.

5. Therefore, IT IS ORDERED, This 19th day of July, 1961, that Sections 12.21(d) and 12.44(a) of Part 12 of the Commission's Rules are amended as set forth in the Appendix attached hereto, effective September 6, 1961.

FEDERAL COMMUNICATIONS COMMISSION

BEN F. WAPLE
Acting Secretary

Attachment:

Appendix

Released: July 21, 1961

NOTE: Rules changes herein will be covered by T. S. VI-9.

APPENDIX

Part 12 of the Commission's Rules is amended as follows:
1. In § 12.21, paragraph (d) is amended to read as follows:
§ 12.21 Eligibility for license.

* * * * *

(d) *Conditional Class.* Any citizen of the United States:
(1) Whose actual residence and amateur station location are more than 75 miles airline distance from the nearest location at which examinations are held at intervals of not more than 3 months for General Class amateur operator license.

(2) Who is shown by physician's certificate to be unable to appear for examination because of protracted disability.

(3) Who is shown by certificate of the commanding officer to be in the armed forces of the United States at an Army, Navy, Air Force or Coast Guard station and, for that reason, to be unable to appear for examination at the time and place designated by the Commission.

(4) Who furnishes sufficient evidence, at the time of filing, of temporary residence for a continuous period of at least 12 months outside the continental limits of the United States, its territories or possessions, irrespective of other provisions of this paragraph.

2. In § 12.44, paragraph (a) is amended by changing "or" at the end of subparagraphs (2) and (3) to a period, and by adding a new subparagraph (4) to read as follows:
§ 12.44 Manner of conducting examinations.

(a) * * *

(4) If the applicant demonstrates by sufficient evidence that his temporary residence is for a continuous period of at least 12 months outside the continental limits of the United States, its territories or possessions, irrespective of other provisions of this paragraph.

14 MC. MARITIME MOBILE APPROVED

Starting August 21, 1961, U. S. amateurs on or over international waters may use 14 Mc. (in addition to 21 and 28 Mc.) anywhere in the world. Those amateurs operating within ITU Region II (roughly, the Western Hemisphere)

(Continued on page 144)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

Rats! . . . In the singular episode of *Silver Blaze* Mr. Sherlock Holmes called Colonel Ross's attention to the curious incident of the dog in the nighttime. "But the dog did nothing in the nighttime," protested the Colonel. "That was the curious incident," said Sherlock Holmes.

The amazingly perceptive senses of animals have long made observations of their behavior profitable in certain situations. Many a heroic canary gave up its small life in days of old to warn miners of the presence of poisonous fumes below. Now K3CUI, an alert student of the art, points out a recently discovered talent of the lowly rat. A staff scientific article in the Washington *Post* mentions

. . . studies made of rat-running activities which were found to be correlated with sunspot activities. Human observers can detect the solar flares, but have no way of knowing at the time whether or not the flares will affect the ionosphere and disrupt long-range radio communications. Some do and some don't. But the rat apparently senses only those which will, according to correlation studies. Such studies on rats, he conceded, might tell scientists in advance which sun troubles will affect our radio communications and which will not.

Wonder if the critters can handle such a flareless blackout as occurred June 9, 1960—and how about their ability to cope with the Argus effect, that phenomenon wherein spatial nuclear explosions trigger ionospheric fadeouts hereabouts? Rat-raising seems an incongruous hobby to combine with one's amateur radio, but the truly determined DXer leaves no touchstone unturned. See you down at the pet shop, OM.

What:

September's the month when 10 and 15 meters usually snap to and spunk up for the long haul, a seasonal improvement that should be evident again this year. But there's a detrimental feel-back at work as a serious DX-limiting factor on those bands: decreasing 28- and 21-Mc. activity by stations at the DX end. Once this trend sets in, good openings come and go with fewer and fewer operators around to take advantage of them. The vicious circle continues until only a residue of local rag-chewers remains, and DX conditions seem much worse than they really are. What to do about it? Well, we can only urge operators in rarer DX regions not to forsake 10 and 15 suddenly and entirely; keep an ear on those bands, emit lots of CQs, and tune farther from your transmitting frequency when searching for replies.

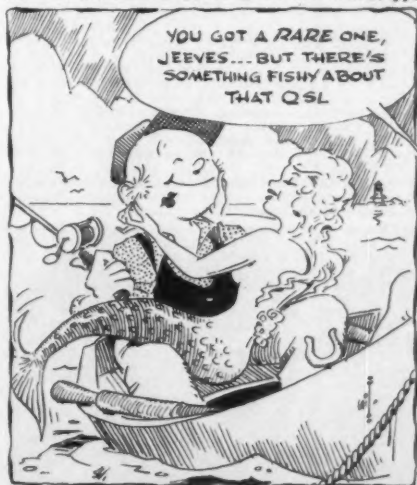
10 phone could have been worse this summer. Occasional breakthroughs from Asia, Africa and the Pacific spiced up the customary South American scenery. WA2LKY, K5s ALU VTA, K6s CJF STZ and WA6DNM mention QSOs with CO2UM, HG1FO, JA1 BWA 1CPZ 2IB 2UJ 3AH 6AFO, KG6s AHF APJ, KR6s DO IK RT, KW6CL, several KZ5s, UA0LBQ, VK3VL, XE3s AH AQ, YN3LBV, plenty of YVs, ZLs 1GH 1RI and 3GJ. . . . **Ten c.w.** still produces JAs 1ALK 1BWA 1BWZ 2ANX 2DB, HK7ZT and XE1FE for WA6DNM and W6KJZ. It remains to be seen whether 28-Mc. W/K/VE personnel will get a decent shot at Europe this season. Our Fours

and Fives will rate most of the propagation breaks that come along.

15 phone's obituaries are highly premature. Spotty propagation doesn't keep K1s KSG MOD, WA2s FQG KMY KWB, K4IKV, K5s ALU JCC KFD P50 VVV WSE, K6STZ, WA6DNM, K8TJW, K9s QMJ VLQ, K9VXU and VE3PV away from CN8MT, CP5EA, CT1PK, EL2V, FS8RT, HC2CB, HHs 2RB 5DM 5RD, HHs DGC* (21,255 kc.), DGH DGN* (235) 0100 GMT, HK1ZU, HPs IAF 18B* (235) 23-1, 3FL, HR3AC, HV1CN, K1QV/VOL, KA2NA, KB6BC* (432) 23, KG4s AF* (425), AL AO (330) 23, KZ5AF*, OA3D, PJ2s AP* CR MC*, PZ1s AZ BW, T12CP, TL8AB, UR2KAE, lots of VK/ZLs, VP3 2DQ 2GAQ (305) 13, 2LS 3FM (190) 23, 3YG 4NC (220) 12, 3AH 5BB 5CD 5CH 9WB, VO4s FK HX, VR2BC, VSs 1DO 9MB, XEs 1EF 3AH (228) 1, YN1BE, YS1RM (270) 3, YVs in number, ZDJJK (154) 17, several ZSs, 5As 2TD 5TA, 5NZAMS (248) 23, 9Q5s CH (367) 19, DQ HV and ID (226) 18, the asterisks denoting single-sideband specimens.

15 c.w. isn't exactly keeling over, either, according to recent reports by K1s KSG MOD, WA2s BQR EFN FQG KWB LKY MEC OCA, K3CUI, W5s BHT EHY, K5s ALU FDK JCC (111/100 worked/confirmed countries), P50 VTA WSE, K6s CJF STZ, WA6DNM, W5YGR, KXs JCB TJW, K9s QMJ UKM VLQ, K6s OSV OSW YXU, IER, KH0VNC and VE3PV who recommend CEs 1AD 1DR 3RY 3TR (30) 0, CT1s EY ID, EA6AM, EL1P, FA9VN, HA1KSA, HBs 1MD 4FB 16, HCs 1JU 2IU (40), a flock of HKs, HP1s AP SB, IT1s AGA TAI ZND, JAs 1BRK 1BTG 1FHT 7AD, KA2s AB KS, KJ6BV, KM6BI (60) 2-5, KV4CI, KW6s DG DJ, KZ5MQ, LZ1KSP, MP4BBE, OA3s 3D 4JH (100) 13, 6AG1 8D, P7LJ (32) 20 de Fernando de Noronha, PZ1s BH BR, SP3JA 22, SV6s WI WT WZ, TF3MB, TN8AF, UA3s 2AC 19, 0GF 0KCO 0KQB, UO3AA, VP3s 3RW (167), 6ZK 9BV 9G 9L (50) 14, VO3s 2WM 5IB 5IG, VS9s AAI ARC MB of the Maldives, WH6ECO, WP4s AYP (145) 20, BAF, XEs 1EV 2PJ, YV3s DY EC, ZC4s AB PB SC SG 5S WD, ZB2AD, ZDs 3P 6RM, many ZLs, ZPs 5CF 5LS 9AY, 4X4s HC MR, 5As 2T2 3TQ, 5UTAH, 6O1MT, 5NZATU, 7GLA (70) 19, 9G1DT, 9U5s D8 and MC, Good summer show!

15 Novice DX hounds WV2s QMC (11/7), QMJ (4/3) REO, KN5s ERQ IFJ, WY6s NSM and OR5 practiced code with CE3GR, HB9ZC, HC2CB, HK3V9, HP1CC, KG4s 4AB (175) 2, 6NAA, KH6s AHQ DOX DS NU (165) 5, KM6BI, KX6BU, SP1AGE, VK5JW, VP6LU (175), WH6s CEZ DUL, WP4AYF, YV3s ARU ANT, ZL1s LE QW and many garden-variety Europeans and South Americans. The possibility of more Novice-type



*7862-B West Lawrence Ave., Chicago 31, Ill.



CR7s EO and DK are a popular Mozambique DX duo from 'way back. Lina and Fernando like 28 Mc. but the sunspot drought now cramps their DX style. (Photos via W9JFT)



DXCC memberships seems at an end but our freshmen crowd should be cutting its DX teeth on 21 Mc. for years to come. Know a more delightful way to get your code up to Generals speed?

20 phone holds up well under its usual heavy summer DX load. WIAPA, K1JKS, K2s TDI UYG, WA2s KMY MEC, W4LJV, K5s ALU VVV, WA6s DNM IVM, WYB1, K8JCB, W9s IHN YMG (113/104 on sideband), K9QMJ, KH6DVG, VE3PV, PA0WR and s.w.l. A. Rugg document the s.w.b. doings of BV1US (310) 12, CN8s FU (327) 22, HX (324) 23, IK (322) 12-13, CP5EA 2-5, CT3AV (290) 0, EA8s BA (318) 18-19, CT (330) 21, ELs IC (343) 0, 6E (272) 20, EP2AG 2, HC6s 1LB IRB (330) 13, 2AL 2, 78C (316) 4, HH0DL (340) 13, H8SCA (344) 23-0, HK5ACP (315) 5, HP1LO (337) 4, HR3HH (328) 8, HVICN (341) 22, HZIAB (314) 5, K4s PGL/VP9 THQ/VE8 21-23, KA2KS (337) 3, KCs 4USC (265) 6, 4USV 6BH (264) 13, 6JB, K6s IBO (273) 1, 1BX (276) 19, ICC ICQ (340) 1, 4AS (309) 23, 6FAE (300) 13, KH6s EDX/KW6 (307) 23, EDY (340) 12 of Kure, KJ6BV (327) 11, KR6s AF (288) 5, CP (334) 11, GH (273) 12, MA (325) 13, KV4AA (320) 1, KW6DB, KX6s AC (337) 11-12, BQ (270) 6, BU (290) 4, DB (319) 12, DK (292) 11, MP4BCC (230) 20, OAs in quantity, OD5CW (342) 22, PZ1s AX (334) 2, AY (327) 22, BF (130) 5, SVs IAP (310) 23-0, IAR (313) 23, 0WN (314) 23, 0WT (316) 4 of Crete, TF2WFX (314) 23, many T12s, UA2AW (250) 20, UB5WF (293) 5, UR2AR (304) 4, VEs 3BQI/SU (280) 3, 5MIC (275) 5, VK8TB, VK9QJ/FKs (130) 5-6, VPs 2AB (118) 22, 5CH 1, 9FR (330) 13, VO6s 3GX (324) 21, 4ERR (325) 20, 5FS (130) 5, VRs IG (142) 12, 6AC (275) 5-6, VS1FO (320) 15, VU2NR (318) 12, WTHMP/KB6, XE1s CV (345) 5, IJ (349) 5, YN1s AA (340) 22, CK (340) 1, TAT (340) 3, Y06XI (240) 23, YS1MM (290) 13, YV1EM (328) 5, ZC1AK 22, ZK2AB (130) 4-5, ZS3E (333) 6-8, 4X4s IX (276) 0, LC (302) 23, 9MZDB (320) 15 and 905US 23, as well as the a.m. efforts of CN8CY, COSRA, CT2AK, EL2F (200) 23, HK3LX, HPs ICN 3IZ, JA1s BG CMG, KA2JL, KW6CGA, KX6AB, SU1KH, VK9s AM (190) of Nauru, CP, VPs IWS 2VA 9WB, VRs 2AS 2AX 6TC (167) 5, 4CB, XEs 1XT (220) 0, 2IL, 3AF (220) 20, 3L (220) 20 and a batch of Venezuelans. If you haven't already studied it, we call your attention to pp. 9-10 of the July 1991 QST concerning 14-Mc. phone DXing.

20 c.w.'s DX market enjoys heavy patronage. Shoppers K1s JFF (92/82), JKS KSG MOD (132/82), K2s JUA (100), TDI UYG, WA2s BQK EFN KMY KSD (88/55), KWB (46/24), MEC (72/25), OCA, K3s CUI DUB KHK MNJ, W4ZM, K4CWV, K5s ALU (70/50), PSB VTA VVV, W6s JQB RCV (101/88), K6s CJF JQJ (295/290), STZ TZX, WA6s DNM (35/33), IVM, W7s DJU LZF YBI (41/18), W8CSK (147/142), K8s JCB LNL TJW (100/62), W9s IHN LCG MAK, K9s QMJ UTM, K9s BQIOSV OSW VXU (72/27), IIER, KH6DVG and A. Rugg queued up for BV1US (310) 13, CMs 2QN 8RM, CN8s JF (55) 21, MB, COs 2AP 2CT 2WU 6AH, CP3CN 1, CRs 4AH 0, 6CA (20) 23, CTs 2BO 1, 3AV, a fistful of DMs, DU6s 1BC (40) 18, IOR 7SV (20) 8-14, EA9CK, EL4YL, ETs 2AS 3AZ, FA8s 8RJ (20) 22, 9VN, FB8XX (40) 7, FG7XC (31) 12, FK8AW (70) 8, F08AC (15) 8, GB2s LS 8M (75), GD3FXN, HA6s 1KSA, ISB 3KGC 4KYB 4YB 6KNB, HC6s 1JU (26) 23, 1LE INA 2CS (33) 3, HH2JV (53) 4, H8SDGC 7, a dozen HKs,

HPs 1IE (10) 16, ISB 1ZO 3FL, HR2FG, HS1s JN (70), R (12) 18, X (37) 14, IS1s DKL ZUL, a half dozen IT1s, JA6s 4HM 4QL 5AI (70) 12, 9KA 0BD, JZ0PH (50) 12-13, KA2s AB (50) 8, CN JL (60) 12, JM (65) 14, KS (80), MA YA (80), KC4s USB USN USV, KGs ICC 4, 1CX 1FD 4AD (14) 23, 4AM 4AN (50) 22, 4BA (16) 2, 6AKG (80) 7, 6AKS (88) 12, KH6s DFQ/KG6 7, EDY (8) 13 of Kure isle, KJ6BV, KL7s AGX (32) 7 and DNE (35) 7 of the Pribilofs, KM6s BI (41) 1, BT CE 4-6, KR6s KS LD NG QW, KV4s AA (80) 19-21, BU (128) 5, KW6s CGA DF DG DJ, KX6s BC (45) 13, BU, LA6s 2NG/p 8YB/p (70) 23 of Jan Mayen, seeds of LZs, OA4FM, OX3NK, OY7ML (20) 22, PHKMA of Holland, PJ2 2AF 2CK 2ME 3AD, PYs 4ZG (60) 2, 7LJ, PZ1s AY BH, RAEM of Moscow, SL5ZL of Sweden, SM2s ABX 22, COL 0, SM5ARQ/905 (80), SVs 1AA 4-5, 0WI 0WO 0WT (95, 30), TP2s 2WFZ 3AB 3KA 23, T12LA, TU2s AF AL (51) 8, UA1KED (72) 8 of F.J.L., UA2s AC (65) 20-4, AO 4, AW (20) 20, BD KAH, UA9s DP FJ FX (60) 3, UA6s BD 6-9, BN FF IK (5) 7, JA JU (62) 14, KFM (67), KID KJA KKS LL (60) 8, MO UPOL-8 of Russia's island fleet, a dozen UB5s, UC2s AD AR AX CS 1, KIM, UG6AB 3, UL7JA, UO5AA, UP2s KNP NM, UQ2s AX BA 5, KAI, UR2s AT BV KAN, UT5GL, UY6s 3AX 3ME 9AH (58) 5, 0FC (55) 15, VEs 8CM 8RW 0MC, VKs 3ARX (75) 12 of Howe, 9GP (68) 6 of Norfolk, 9VM, VK6s JB (30) 4 of Wilkes, VK 7, VO6s 1AU 1FT 2AW 2RC, VP3s 3MC 4WI 5BF 5BL (30) 12, 5BK (12) 11, 5M (41) 3, 6LN (82) 11, 7NP 7NQ (30) 13, 9BV 9EP 9EX 9G 9QQ, VQs 4HE 8GC, VRs 1G 2DK (90) 13, 3L 6TC (167) 5, VSs 1FS (30), 1FZ IJY IKA IKP (19) 15, 1KQ 14-17, 1KT (50) 14, 6AE 80 12-13, 6EN (45), 6EP 9AAC, WA6s KMT/KM6 NDK/VP9, XEs 2UA 3BL 23, 3FJ, YN3KM, numerous YOs, YV7AH, ZAKFF (67) 6, ZB6s INZE (64) 23, 2AD 2L, ZC4s AK FD PW WB (30) 4, ZD73SE (60), ZKs 1AK (130) 4-5, IAR 2AD, ZP6s CF (5) 6, LS 20, ZS3GL, 4X4s BT MB MT MZ, 5As 3TR (10) 22-0, 5TA (20) 23, 5NZs JKO 7, LKZ 0, RSB, 5U7s AC (30) 7, AH, 60IMT, 9G1s DE DT, 9M2FK and 9USTT. Even better conditions loom ahead as we near the autumnal equinox, so grease that beam and squeeze those dials!

40 c.w. stands to benefit heavily as we swing into early fall conditions. Anybody cracking the 7-Mc. long-path stuff yet? Meanwhile we find WIAPA, K1s KJS KSG KSH MOD, W2APH, K2JUA, WA2s BQK KBE KSD KWB, W9URE, K5s ALU P80 VTA, W6RCV K6CJF, WA6s DNM IVM, W7DJU, W9MAK, K9VKC, K9VXU and KH6DVG cracking the cracklings on 7 Mc. for BV1s US 13, USA 12, CE6s 1BD (20) 2, 2ET 3RY, CM8RM 1, CN8s BP MB, CP1DA, CXs 2BT 4IK (5), HA6s 1KSA (10), 3KGC (33), HK6s 1AAK (7), 1QQ, 3VU (21), 4JC (4), 7UL (30), JA6s 1BRK IC1U ICUM ICVD ICWM IECW IEEB of Marcus, IEFY 1EUY 1EZV 1FAQ 1FDU 1GHI 1HCD 1HLR 12, 1HQ 1HZN 1WPM 2CE 2UJ 3AIS 12, 3RXZ 3CF 3CIV 3DDG 3KM 4AI 4FF 4UZ 5AF 5MG 5MM 6AEJ 7ADD 7AKC 7AMK 7NK 8AAG 8ABO 8AGE 8AHO 8AHU 8UY 8YF 8YZ 0NW (where are the JA9s?), JY1XY, KC4USV, KV4CI (1), KW6DG, KZ5MQ (1), LU1ZL LZ1KPG (5), OA4FN (6), OE6s 3LI (15), 7EW (9), OX3DL (3), PZ1A, UA0EW 10, UB8ZE (2), oodles of VK6ZL, VP6s 3YG 4TE 9AK (9), 9BO 9L, VQ2WR 22, VS6DV 12, gobs of XEs and YUs, YO9IF (8), YV5s A1Z AL ANT AZY (50), ZB2AD, ZS1s

A O JA, 4X4LQ, 3A2AR and 9K2AS (10) . . . WIAPA and WA6IVM keep 40 phone represented with sidebanders KC4s USH (205) 11, USV (205) 8, several KH6s, KP4s AUX AXI YD (208) 12, ZL5ID (96) 10 and a.m. candidate JA1BNK.

80 c.w. "is fine at three in the morning for those who can drag themselves out of bed," opines W7DJU. Dale, K1s KSG MOD and KH6DVG insomniaculate for a stack of VK/ZLs, E19J, KV4C1, KW6DG, VP9ED, VR2DK and a helping of G-DL/DL-OK stuff from the northeast. Eighty and 160 entertain great DX expectations for the fall-winter season ahead. Got your long-wires stretched out tight?

Where:

Africa — Geopolitical flux on the now-not-so-dark continent has resounding repercussions on the DX scene. In addition to the TL8-TN8-TR8-TT8 items in the directory to follow, these stations are apparently reachable at the old FQ8 *Call Book* addresses indicated: TN8s AC (FQ8AD), AD (FQ8AE), AF (FQ8AF), AJ (FQ8AJ), AY (FQ8AY), AL (FQ8AW), AO (FQ8AZ), AS (FQ8HJ), AX (FQ8AX), AY (FQ8AY), TT8s AB (FQ8AT), AC (FQ8HJ), The West Gulf DX Bulletin learns from P9RS that Malagasy Republic (Madagascar) trades in its FB8 label in favor of 5R8, while Mauretania swaps FF7 for GT5. "I will QSL 100 per cent including s.w.l. reports," asserts VE3BQL/SU. Eric can be reached at FQ8AJ, AY (FQ8AY) 2 S/Sgt E. C. Veale, 56th Canadian Sig. Sqdn., CAPO 5049, Montreal, P. Q., Canada; or (3) S/Sgt E. C. Veale, 56th Canadian Sig. Sqdn., UNEF Base P.O., Beirut, Lebanon. The last is recommended for non-W/K/V contacts. "CR7s DK and EO now are in the hinterlands of Zambesia, Bajone," comments W9JFT. "No post office there, so mail is flown in twice weekly from [the address following]." "DL7AH writes from the Congo where he hopes to become 9Q5AH. "If and when I get on the air here W2HJM will handle my QSLs." "ZSTP wonders if some W/K QSL managers for rare DX occasionally bite off more than they can chew. Peter points out that overseas DXers operate at some disadvantage in dealings with State-side QSL chiefs. "To the many QSL managers who are fulfilling obligations goes my deep appreciation for their outstanding work. I know it's really tough going. When I came to Swaziland I brought 12,000 cards; I now have 1500 left. Many stations will have more than one QSL from ZSTP due to crossing repeat requests acknowledged." VERON's DXpress says ex-FB8CM now signs 5R8CM, so Madagascar hams may be hanging onto their old suffixes under the new prefix. "K2UYG tells W0DXC that OKIACO is the CAV recipient of QSLs sent to 7G1A. The Gulf gang also have it that TU2AL cards began disseminating in late July.

Oceania — Consistently blah summer conditions are giving QSL managers fits. The usually expeditious arrangement of receiving log transcripts by wireless is breaking down here and there. K3QXG writes, "VK6VK has not been able to get into the east coast for eight weeks. Any W/K who works VK6VK is urged to accept any untransmitted log data for immediate mailing to me." VERON (Holland) adds in the same vein, "G8KS has lost track of VP8EG, South Orkneys. Ls requests the gang to help him reestablish contact with Ron who is supposed to be active every Tuesday at 1930 GMT on 14,060 or 21,050 kc, and to accept for relay any log transcripts outstanding." One negative consolation in these circumstances is that those log transcripts should be brief. "If your KH6EDY Kure island contact had Jim Hunt at the key, VETZM may be able to facilitate QSO confirmation. "VR2DS comments, "Years of reading QST and W/K complaints about not receiving DX QSLs have prompted me to try an experiment. Since the beginning of this year I have QSL'd every U.S.A. contact. The return has been disappointing — less than 50 per cent. I'll carry on for a few more months. If response does not improve I'll have to revert to QSLing only on receipt." "Radiogram from Macquarie's VK0FZ confirms W5WW as Fred's QSL aide on our side. "VERON notes that KC6UZ has been separated from his logs while in Washington, D. C.

K3HVN's XYL handles K3HVN/PK verificational duties at the home QTH, says WG1XC. "KM6CE assures K6TZX of a 100-per-cent QSL policy.

Europe — RAEM of Moscow writes NC1DXC re Frans Josef Land doings: "UA1KED began work on March 3rd . . . I received their log for March and April. By that time they had 600 QSOs, mostly W/Ks. . . I devoted several nights to writing UA1KED QSL cards." "E10AB's Aran Islands QSLs are shipped by EA1X via bureau if no postage defrayal accompanies cards received. "HB9DX tells K1MOD that confirmations for his 300 springtime HB1DX/8 Liechtenstein QSOs are dispatched on receipt of incoming cards. "One fringe benefit accruing to Russian amateurs is the free handling of QSLs by the Soviet post office, learns K3CUI. "PA9WR wants to reach the operators of TA2AR and YA1AO, among others. VERON indicates that TA2AR made QSOs from Turkey, encountered trouble over it, accepts QSLs via ISWL but declines to confirm contacts. "OH3s TY and VJ vow 100-per-cent QSL for Alands activity this summer. "SL3ZO reports 100-plus W/K orders for the Polar Bears Radio Club's U.S.S.R. clubbook. "Check with PBRC, Solgardsgatan 15, Ornskoldsvik, Sweden.

Hereabouts — Note from KZ5SW: "U. S. stamps are not usable in the Canal Zone. Having mailed out about 3000 cards in the past three years, I cannot afford to QSL direct to W/Ks. Unless I receive IRCs I now QSL only via International Short Wave League. This seems to work out well, although I find that too many stations seem to keep envelopes on file with their local ARRL QSL Bureau managers. Other KZ5s are in this same boat, and some simply do not QSL. Incidentally, cards received here via bureau are easy to keep up with. Once each month I pick them up and send out replies at once, a three- or four-hour task. So far as I know I don't owe anyone a QSL. Yes, it's quite a chore, but I really burn when I get asked over the coals for 'not QSLing.' I might add that U.S. amateurs certainly are getting sloppy in filling out cards." Ted feels that every station's QSL ought to bear enough pertinent info to qualify for use in filing for secondary certifications. "W40PM, QSL charge for sidebander VP6WD, expects Mac to QRT soon for New Zealand. Joe has logs dating from the first of this year. "Mailing of confirmations for VP6WD QSOs is up to date for those who have supplied s.a.s.e., or s.a.e. and IRCs." "I am now QSL manager for YV5AJK," declares K8HFJ. "The usual s.a.s.e. rules apply." "Cards for VP5CD's May South Caicos work should go via the KP4 bureau," affirms KP4VQ. "Where direct reply is desired by W/Ks, s.a.s.e.s should be included." "KN3OAR, K9AUB and K8UTX offer their services as State-side QSL agents for deserving overseas DX men. "WA2OCA wants scoop on "K86EJ" and K8RBW hangers for a tracer on 9G1AQ. "As candidates for our "QSLers of the Month" salute, K1KSG recommends CP1DA, FY7YI, TF5TP, UA0AZ and VP5BL. K2UYG similarly nominates 601MT, and K3MNJ sponsors YV5AXA. FB, OMs write in remarks to W7LZF, W0FPE disclaim connection with LA7RF/mm QSL matters. "W0DWN discontinues his "QSL Co-op" over Kansas City way. "This month's crop of suggested QSL routes comes courtesy W1s APA DGL LLF WPO, K1s JKS MCD, W2APH, K2s TDI UYG, WA2s EFN FQG KSD OCA, K3s CUL KHK MNJ, WA1UO, WA1KY, W5EHY, K5s ALU P8O VTA, W6RCY, K6s EX STZ TZ, WA4NDM, W7s UVR YBI, W8KML, K8TJW, W0s IHN JET, K9s UTM VLQ, K0GZN, KH6DVG, ZS7P, Far East Auxiliary Radio League, International Short Wave League, Japan DX Radio Club, Newark News Radio Club, Polar Bears Radio Club, Northern California DX Club, VERON of Holland and West Gulf DX Club:

CN2AR, RCA, Box 2087, Socco, Tangier, Morocco
CR5AE, P.O. Box 77, Bissau, Portuguese Guinea
CR6CA, J. Cabral, Box 332, Benguela, Angola
CR7CR, C. Albuquerque, Box 594, Loc. Marques, Mozambique
CR7s DK EO, F. and L. Romero, Caixa Postal 394, Quelimane, Mozambique
CR7FN, F. Ferreira, Caixa Postal 852, Beira, Mozambique

IS1DKL makes full DX use of his roomy installation at Cagliari where single-sideband sport now supplements extensive c.w. activity. (Photos via K2UYG)

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CPSEA (left) and HK7ZT are very popular South American entries on DX bands. Hugo, in Cochabamba, enjoys single-band doings near 14,330 kc., often on Thursdays and Saturdays around 0200 GMT with 150 watts to a 10-B, homemade linear and rotary beam. Antonio, of Bucaramanga, nears DXCC and WAS with a Globe Chief, HQ-140X and dipole, mainly via c.w. HK7ZT teaches code at his local radio club and is responsible for a fresh outburst of DX activity by new HK7s UL YB and YC. (Photos via Ws 1BAN and (KJZ))

CR7IZ, E. Graca, P.O. Box 812, Loc. Marques, Mozambique
 EL2Q, P.O. Box 417, Monrovia, Liberia
 FP8BR (to K1MOD)
 ex-FQ8HT (to TL8AC)
 HC2AL, Box 923, APO 825, New York, N. Y.
 HH2PW, P.O. Box 235, Port-au-Prince, Haiti
 HH2RB, P.O. Box 446, Port-au-Prince, Haiti
 HK00Q, San Andres (to HK1QQ)
 HL9KT (to K2HWF)
 HSIK (to W5OZI)
 IP1TAI (to IT1TAI)
 IP1ZGY (to IP1ZGY)
 JASAI (via K2QXG)
 JZ0PH (via VERON)
 K1QVI/VOI, S. Hawley, VW-11 Radio, Navy 103, FPO, New York, N. Y.
 K4THQ/VE8, H. Odil, APO 432, New York, N. Y.
 K6COV/K56, P. Hodges, P.O. Box 307, Pago Pago, Samoa
 KA2AB, V. Smith, 287th GEEIA Sqdn., Box 154, APO 323, San Francisco, Calif.
 ex-KA2IE (to W7ANH)
 KG6AKS, USN MCB-11, FPO, San Francisco, Calif.
 KH6DFQ/KG6, P.O. Box 445, Agaña, Guam, M.I.
 KJ6BJ, USCG Loran Stn., APO 105, San Francisco, Calif.
 KL7SFN/KL7, Box 1155, Kodiak, Alaska
 KM6CE, Box 23, Navy 3080, FPO, San Francisco, Calif.
 (or via KM6BI)
 KX6BC, Box 117, Navy 824, FPO, San Francisco, Calif.
 KZ5MO, M. Walsh, P.O. Box 1287, Balboa, C. Z. (W/Ks via K5VTA)
 KZ5SW, S. Wilds (W4GVD), Box 2519, Balboa, C. Z.
 LA8YB/p, F. Jensen, % Norwegian Embassy, Reykjavik, Iceland
 LX1s DX QX, P.O. Box 331, Antwerp, Belgium
 LX3MA (via DAUS)
 MP4s DAC MAB QAO TAE, % R. Baines, 56 Balmoral Rd., Gillingham, Kent, England
 OD5CN, P.O. Box 5034, Beirut, Lebanon
 OK2LE, Podvesna VII 2051, Gottwaldov I, Czechoslovakia
 OK3GCE, R. Novak, Barcovaheho 28/2, Trnava, Czechoslovakia
 PK2HT (non-W/Ks via 9M21Q)
 SLJ3O, Radio Club, Solgardsgatan 15, Ornskoldsvik, Sweden
 SL5ZL (via SM5WI)
 SV0WN, 2140th AFCEP, P.O. Box 647, APO 223, New York N. Y.
 TL8AG, P. Sevestre, Box 54 or 785, Bangui, C.A.R.
 TN8AA, G. Delas (ex-FQ8HY), Box 574, Brazzaville, R. C.
 TN8AB, A. Castry (ex-FQ8AC), Box 2253, Brazzaville, R. C.
 TN8s AC AD AF AJ AK AL AO AS AX AY (see preceding text)
 TN8AG, J. Huguet (ex-FQ8AM), Box 173, Brazzaville, R. C.
 TN8AI, P. Guillard (ex-F8SPG-FQ8AQ), Box 233, Dolisie, R. C.
 TN8AM, S. Guye, Box 2070, Brazzaville, R. C.
 TN8AP, J. Fees (ex-FQ8HB), Box 1132, Point-Noire, R. C.
 TN8AQ, P. Pouehla (ex-FQ8HC), Box 298, Brazzaville, R. C.
 TN8AR, R. Robinson (ex-FQ8HD), Box 894, Brazzaville, R. C.
 TN8AT, M. Larrieu, Box 108, Brazzaville, R. C.
 TN8AU, R. Lafond (ex-FQ8HP), Box 41, Brazzaville, R. C.
 TN8AV, A. Gray, Box 2243, Brazzaville, R. C.
 TN8AW, R. Blondeau (ex-FQ8HR), Box 2013, Brazzaville, R. C.

TN8AZ, P. Rossignol (ex-FQ8HZ), Box 574, Brazzaville, R. C.
 TN8BA, A. Noger, Box 2012, Brazzaville, R. C.
 TR8AA, A. Wailly, Box 13, Libreville, Gabon Republic
 TR8AB, J. Diore, SGCFG, Port Gentil, Gabon Republic
 TT8AA, H. Gondoin (ex-F8MQ-FQ8AA), B.A. 172, Ft. Lamy, Tchad
 TN8AD, H. Pieredu (ex-FQ8HL), Box 449, Ft. Lamy, Tchad
 TT8AE, G. Matheron, Box 460, Ft. Lamy, Tchad
 TT8AF, R. Thierry, Box 138, Ft. Archambault, Tchad
 TT8AG, L. Bucci (ex-FQ8HW), 2° ESIMA, Largeau, Tchad
 TT8AH, Barange, SMB, Largeau, Tchad
 UA90I, Radio Club, Michurina Str. 36, Novosibirsk, U.S.S.R.
 UB5CG, A. Zhubra, Postbox 231, Odessa, Ukrainian S.S.R., U.S.S.R.
 UB5WF, P.O. Box 41, Lvov, Ukrainian S.S.R., U.S.S.R.
 VE3BQL/SU (see preceding text)
 VE8MC, CGS Stantown A.R.C., Radio Aids Workshop, 202 Harbour Rd., Vancouver, B. C., Canada
 KH8IA, P.O. Box 41, Darwin, N. T., Australia
 ex-VK8TB, to 1237 18th St., Huntington, W. Va.
 VK8TE, Box 416, Darwin, N. T., Australia
 VK9BK, Fr. B. Madden, Mendi, S. Highland Dist., Papua Ter.
 VK0FZ (via W5WW)
 VK0TG (via Z8TP)
 VP2SO (via K3COW)
 VP3RW (via W3CTN)
 VP4NC, Rev. L. Purdy, Naphrima College, P.O. Box 39, San Fernando, Trinidad, W. I.
 VP5GT, Grand Turk AAFB, GMRD, P.O. Box 4187, Patrick AFB, Fla.
 VQ8BD, Royal Navy Wireless Stn., Mauritius
 VR2BJ, M. Gray, P.O. Box 4, GPO, Suva, Fiji Islands
 VR2DS, P. Corner, P.O. Box 210, Nadi Airport, Fiji Islands
 VR3L, Christmas Island R. C., BFPO 170, % Postmaster, Honolulu, Hawaii
 VR4CC (to ZL3DX)
 VS9AAI (via RSGB)
 YJ1ZZ (to ZL3DX)
 YN4CF, Padre Delberto, P.O. Box 8, Bluefields, Nicaragua
 YN0CV (to K4KCV)
 YN0NW (to W8NW)
 YV3EC, P.O. Box 445, Barquisimeto, Venezuela
 YV5AJK (via K8HFFJ)
 YV5AXA, Aptdo. 3735, Caracas, Venezuela
 YV6BW, D. Abzueta, P.O. Box 406, Puerto la Cruz, Venezuela
 ZA1KA, P.O. Box 888, Tirana, Albania
 ZA2KB (via CAV)
 ZDIES, to Ontario DX Assn., 127 Castlewood Rd., Toronto 12, Ont., Canada
 ZD6s GA PR, Box 16, Mauzu, Nynasland
 ZS3E (via K4PUS)
 3A2s AD BP (via W4OPM)
 5A2TZ (via W4OHH)
 5R6CM (to FBSCM)
 9Q5CI, P.O. Box 16, Kamina, Katanga, Central Africa
 9Q5DQ, to 2111 White Av., Knoxville, Tenn.
 9U5NC, C. Colares, P.O. Box 1138, Usumbura, Ruanda-Urundi

Note: The preceding catalog is necessarily neither accurate nor "official". One can't have everything.

Whence:

Oceania — WIA (Australia) welcomes your indulgence

in the annual V/K/ZL DX Contest, a farflung affair wherein non-VK/ZLs work as many VK/ZLs as possible and, logically, vice versa. The phone fun runs from 1000 GMT September 30th to the same time, October 1st. C.w. men get their lumps beginning 1000 October 7th, concluding 1000 on the 8th. The customary RS- or RST-with-consecutive-QSO-number exchange applies (RST001, RST002, etc.) except that you can start with any QSO number between 1 and 100. Scoring, for non-VK/ZLs: One point per station per band, this total to be multiplied by the number of Australian and New Zealand calls areas worked (ZL1-through-5, VK1-through-9) for final score (note that VK8 is included this year). Your entry, listing date, GMT band, call and serials sent/received for each QSO, should indicate claimed points in adjacent right-hand columns, a separate document for each band. Attach a summary sheet bearing total claimed score, a brief station description and a signed declaration that rules have been observed, and rush it to Federal Contest Committee, WIA, GPO Box 851J, Hobart, Tasmania, postmarked no later than November 8, 1961, to compete for possible certificate awards. By the way, this is a single-operator competition, no cross-band work considered. G'luck! WIs DGL and LLF say VK8TB turned over his KWM-1 to VK80W before heading back to West Virginia. 'Tis widely hoped the unit will eventually provide CR10 QSOs VR2DE leaves for ZL-land "October," states VR2DS. "I'll be looking after his interests here; he won't be back." K6RWP/mm operates aboard 38-ft. ketch *Mariachi* with a G-66, G-77, W2EWL exciter and vertical on 15 and 20 sideband. K6CVR says schedules are kept with K6GHU. *Mariachi*, after completing the California-Tahiti race, may continue on a year's circumnavigational tour. W4ZM observes that K10FEDN's operator Bob's VK9AM gond, around zero GMT and hopes to work all United States before retiring from the service next year. Speaking of skyhooks Kure's loran tower is a 625-footer K6TZX understands ZK1AK was to leave for New Zealand last month Pacific pointers via NCDXC, PBRC, VERON and WGDXC: ZL3GX's FK8-YJ1-VR4 jaunt is scheduled to terminate in a visit to the South Islands. W4ZM gets over to Manihiki now and then with his QRP 40- and 80-meter rig. ZL3IS whipped up a compact portable station for possible VR5 work. JA1EEB, relieving JA7QQ at the weather station this month, hopes to keep Marcus workable till December. He likes 7 Mc. "Until we get our gear TVI-proofed there won't be much ZL DX activity in this area," says ZL1RY concerning the onset of television down under. Several PK2s are reported active on 15- and 20-meter voice. A good sign, but only K3HVN/PK is in the clear for W/K work at this writing.

Europe — NRRL (Norway) invites your participation in the 1961 *Scandinavian Activity Contest*, a DX free-for-all in which non-Scandinavians will rustle up as many LA/LA/p OH OH6 OX OY OZ and SM/SL brethren as possible, quite naturally, vice versa. Phone festivities commence 1500 GMT September 16th and wind up at 1800 on the 17th; the c.w. period goes September 23rd-24th, same times. Serial exchange is the usual RS- or RST001, -002, etc., everybody starting with QSO No. 001. Scores are calculated at one point per completed QSO, this total multiplied by the number of Scandinavian band-prefixes accumulated. Operation is permitted on 3.5 through 28 Mc., so a maximum multiplier set of 40 is possible. There's a multiplier category to accommodate that old team spirit. Your entry, a separate sheet for each band, should include a summary sheet and must be postmarked no later than October 20, 1961, to NRRL Traffic Dept., Box 898, Oslo, Norway, to be eligible for possible certificate recognition. W9BZW finds WB2AD searching for Mont., Nev. and N.Dak. to wind up WAS on 14,050 kc. around 0300 GMT W9YMZ is amused to note that SS *Bon Jour*, with SM5BXI/mm aboard, pours rock 'n' roll music into Sweden from a distance beyond the jurisdictional disapproval of the state-managed broadcasting system K4TWK found ex-SUMS, now DJ6FB, visiting with DL3JH and other prominent DX personalities S.w.I.S. Elfing Sweden claims 300 countries confirmed on the amateur bands. Sven reports a

June DXcursion by the SL3ZO gang as SL2ZA, producing the first a.s.b. noises from that rarish call area According to data filed with ARRL Hq., Czechoslovakia has had an increase in licensed amateurs amounting to 612 per cent since 1955, plus an a.w.l. increase of 340 per cent Azores slowdown via K1KXZ: CT2BO continues active on c.w. although worsening prop conditions dampen Gil's ardor. CT2AK is on with a.m. and is studying c.w. for extended operating privileges to include sideband. No chance of U. S. personnel obtaining hamming authorization in the Azores at present. K1KXZ is supposed to leave CT2-land this month, so we'll lose a valuable correspondent from the balliwick. OH3s TV and VJ had 200 watts, a quad and verticals ready for their summertime c.w. and s.s.b. Alands venture PA0WR, licensed since '23, nears phone DXCC with his new rotary beam. Big signal near 14,180 kc. when the north Atlantic path is open E16X reports 400 E1AB Aran Islands QSOs in late May thanks to E1s 2X 3B 4A1 ABC 5AJ and 6WJ. E16X complements of s.w.l.s. A DX-100, Globe Scout, SB-10 and HRO-MX worked out well despite trouble with stubborn generator hash.

Asia — SS *Hope* put into Saigon after a busy stay in Indonesia but radiop W6PHF is pessimistic about possibilities of operating in this area. "We sail for San Francisco in September; this should mean plenty of en-route hamming." Gosh omen — EP2AP secured a batch of ARRL *License Manuals* for the use of several would-be EPs Israel items via 4X4NJ (K7ADD): "Compared to what I was used to Stateside, DX conditions here are 'fantabulous'. I've been on the air ten weeks now and have worked 107 countries. Recently attended a meeting of the Haifa A.R.C. where 4X4HF's 25-watt phone rig works several bands on a cheap IFT and Edystone receiver. I've also visited 4X4HQ, the club station in Tel Aviv. By the way, holders of the Israeli Class C license (corresponding to the U. S. Novice Class) now receive calls beginning with 4X4N followed by two letters. The 'N' is dropped when they get the next higher class of license." K2UYG drools over the possibility of early AC3 and/or AC5 activity of the semi-DX station. K6CJF's total of different JAs contacted now stands at 495 with 316 confirmed. The JA 7-Mc. onslaught has abated somewhat due to changing transpacific conditions and liberalized 14-Mc. privileges in Japan FEARL, NCDXC and VERON Eastern observations: VU2KV years for DXtensive VU2KV/AC3 action. VQ4NZK and HB9PL produced their smash JY2JNZK performance while on location for Cinema Pictures. MP4QAO dropped in at the shiekdom of Abu Dhabi for some interesting June MP4DAC QSOs. Among 1800 contacts, apparently only three U. S. Sixes made the grade with 9K3TL. We see that KA2IE goes home to W7ANH, while W7OCD hopes to resume KA2GI status.

Africa — Z3TF provides info from Swaziland and proximity: "New a.s.b. actives are ZD0s GA and PR. They're mostly on 20 meters, week ends. CR6CA keeps active on 14 Mc. with his HT-32A and HT-33. I enjoy rag-chewing with the boys Stateside and am contemplating erection of a rhombic to improve signals in that direction. I also seek the one holdout Q8L I need to complete WAVQ." "I'll arrive Egypt around September 1st," writes VE3BQL/SU. "In addition to the usual 10, 15- and 20-meter work I will operate 40, 80 and 160 during the winter months; some c.w., mostly phone." "HH9IDL, LX1RK and 4X4AO are with me here in the Congo," remarks DL7AH. "Be advised that the old QOs still are officially licensed as 9Q5s but very few of them are active under present circumstances." From W6JFT: "ZE7JV, busy on 10 through 40 with m. and c.w., will add single-sideband to his bag of DX tricks." "ZD9AM will be on Gough isle for another year," confides K2UYG Ex-FQ8HT has a pair of 807s and a triple-con super going in Bangui as TL8AC. W8KML says Pierre will fire up a new 21-Mc. beam shortly NCDXC African advices: Ruanda-Trundi remains quite radiowactive with 9U5s BH DS NC PD on voice, 9U5s NC and TT on c.w. 5UTAC expects to enhance his 40-watt Niger doings with improved receiving facilities.

VU2AK displays a sturdy setup in New Delhi. Les recently filed for DX Century Club membership. (Photo via W1WPO)



September 1961



KR6LY causes a surprising amount of c.w. DXcitement with this compact arrangement and cubical quad. Bob signs K4UEE when home in Birmingham. He concentrates his Okinawa DX efforts mainly on 14,055 kc. between 1200 and 1400 GMT. (Photo via K5PSO)

Hereabouts—Souvenir hunters should note that the Radio Club of Santander Columbia (HK7) will have a contest from 1700 GMT Sept. 7 to 1700 GMT Sept. 16. Apparently all entrants receive a souvenir banner; that's all the dope we got. "DXCCC" No. 42 falls to W1RCQ, prominent Massachusetts DXpert. Bill found quite a challenge in meeting the simple stipulations mentioned on p. 69, July 1959 *QST*. . . . The ham bug runs in the family sometimes. HK7ZT's brother is EA2CL, for instance, and "How's" contributor W4IYM has traffic hound W2RUF for a sister. . . . W7YBI, former staffer at HZ1AB, K2ARB and K06CD, now tries for DXCC from our side. . . . W5LII expects to keep signing LU6MI for a year or two in Mendoza. K4IKV finds John punching through near 21,240 kc., 2300 GMT. . . . Contest king and DX ace W4KFC personally chatted with TI2s BX LA PZ, HR1LB, TG9RB, YN1CAA, KZ5s JW WZ and other Central American friends during a May business tour. Vic naturally tried a few 14-Mc. QSOs from the DX end. . . . Time doth stagger on, by golly. Young ARRL SCM W6JQB, who ran the ARRL DXCC Desk in the late '40s as W1QMI, is a brand new grandpa. Al likes to reminisce of early experiments with a rotary beam on the shores of the Pacific. It consisted of one pole, a long piece of wire tied to the pole-top, and a bucket of sand anchoring

the low end. When the Asians dropped out and the Europeans started coming through, Al would grab that bucket and gallop for the other side of the stick. . . . K9RXJ, with 97 countries worked in Denver, meditates on the possibility of DXing from Emory College, Atlanta, with no visible antenna permissible. . . . W9GFF notes incomplete calling procedures in recent pile-ups—e.g., DE K4XXX DE K4XXX DE K4XXX with pauses—causing us to remind you that this doesn't jibe with amateur rule §12.82. . . . The May 10th-12th multimode VP5CD South Caicos DXtravaganza of KP4s AOO AVQ CGB, W46QPE/-KP4 and VP5CD resulted in 915 contacts with 33 countries on 80 through 10 meters despite mediocre radio conditions. Fire aboard the transporting aircraft caused a turn-around and one day's delay in activation. . . . W4QFM figures you've got less than a fortnight to nail Barbados on s.a.b. VP6WD's shutdown and departure date is set for the 15th of this month. Mac can usually be found between 14,335 and 14,347 kc., 1900/2000 GMT on Mon., Wed. and Fri. . . . KZ5SW intends to add 40- and 75-meter action to his customary 10-, 15- and 20-meter single-sideband agenda. "I'm no avid DX hound but I seem to work a lot of DX. How about encouraging more work on 10? Many times the band is wide open but inactive. More calling and less listening, please." Ted helped KZ5AF/KZ pile up 1700 phone QSOs on Field Day. . . . Closing local chatter thanks to NCDXC, PBRC and WGDXC: W0RRN daily offers 8.Dak. at 2200/2300 on 15 c.w. . . . W9EVI threatens more Malpelo maneuvers by 1965. . . . Six-land's Mr. DX, W6TL, saddened a host of admirers by joining Silent Keys in June. . . . VP2VB's *Yasme III* ought to be ready for Pacific DX doing this month. . . . Odyssean DXpeditionary plans of W4s BPD and ECT are shaping up. Early next year such delicacies as St. Marie, Isle Europa, Agalega, Aldabra, Dubai, Ras Al Khaima, Fujairah, Ajman and Um Alquwain may be on Gus's itinerary, as well as more-commonplace areas like Mt. Athos, Doney, Cape Volta, Tromelin, Gabon, Comoros, Kamarin, Goa, Damao and Diu. Looks as though Marco Polo was a piker.

Ten Years Ago in "How's DX?"—Larson E. Rapp, W1OU, keynotes the September 1951 column with an ultra-practical commentary on postwar DXing techniques. . . . The midsummer DX festival on 20 c.w. features entertainment by AC38Q, AP2N, C2 2AP 3AB, CW1s OX TO, EK1BT, FK88AL, FW8AA, IIAHR/M1, LB5s XA ZC, MB9BJ, MD2s AM DW, MD5PM, SU1s AD GM, VR4AB, VT1s AC AF, XU6F, 3A2s AC AF, 7B4QF, 9B3AA and 984AR. . . . Some of the fancier phones on 14 Mc.: AC3PT, EK1WY, HC8GL, JA0J of Iwo, OY3FP, UH8KAA, VRIE, ZC1AL and 7B4UM. . . . Forty is just except for a few items like FK8AB, F8B8X and VK1JW of Macquarie. . . . W4BRB almost singlehandedly keeps 80 c.w. jumpin' by encouraging summer 3.5-Mc. action by CP5EK, FA8DA, FG7XA, KS4AQ, OQ5LL, OY7GO and VQ4CM. . . . Andorra, Cocos Island and VR3IGOs are noised about. . . . Cuba's ARALV and the Brisbane (Aus.) DX Club offer new certifications to collectors of CM/CO and VK QSLs. . . . PJs still seek full legal recognition by Netherlands Antilles authorities. . . . Jeeves devises a brute-force TVI filter, while pictures of CO6OK, DL4FS/3A2AB, HB9III and KG4AK doll up your DX documentary.

Strays

You high speed c.w. men will want to have a try at the high speed code test, sponsored by the Connecticut Wireless Assn., Inc., on Sept. 11 (Sept. 10 by local time). Transmission starts at 0100 GMT, instructions at 0130, first speed at 0145. W1NJM will be on 3637 and 7120 kc., K6DYX on 3695 kc., W6EOT on 7005 kc. Speeds will be 60, 55, 50, 45 and 40 w.p.m. in that order. Certificates to those who qualify by copying one minute solid out of five.

The Borderline Friendship Award, to commemorate the longest unfortified border in the world, can be obtained by working an amateur in each Canadian province and each U. S. state that touches this border. You must, in addition, work a station in either Sault Ste. Marie, On-

tario, or Sault Ste. Marie, Mich. Send your QSLs, or sworn abstract of log, to C. W. Egglefield, VE3EOV, 18 Laurentian Drive, Sault Ste. Marie, Ontario, together with a fee of \$1.00.

CBS will present a documentary film on "Project Hope" (see *QST*, April, 1961, p. 51) on September 20 from 2030 to 2100 EDT. If you listen around the ham bands these days you may hear W800LJ/3W8 on from Saigon.

The Baton Rouge ARC will award membership in the "Loyal Order of the Red Stick" to any ham working 10 members of the BRARC after March 1, 1961. Send lists of QSOs to BRARC, P.O. Box 14651, Baton Rouge, La.



Correspondence From Members-

The publishers of QST assume no responsibility for statements made herein by correspondents.

THANKS

❖ I would like to thank you for helping me obtain my Novice ticket. Last night I took the test with a ham friend and I passed it. I studied and followed the lessons for code and theory in *The Radio Amateur's License Manual, How to Become A Radio Amateur, and Learning The Radiotelegraph Code*. These books have definitely paid for themselves ten times over. — John Gniady, Chitopee Falls, Mass.

❖ Tnx, OMs, for the reprint of "Your Novice Accent," which I just received in the mail. It set me straight on just how to operate and how I wish the other Novices would follow suit. — John M. O'Neill, WY2SMQ, Utica, New York.

❖ I have been licensed as a Novice operator for approximately four months and have been using operating procedure which I picked up in books and in some cases thought instinctively was correct. Today I received in the mail the article "Your Novice Accent" by Keith Williams, W6DTY, which was most enlightening. Some of the points in the article certainly clarified some things which were puzzling to me. I'm sure there are many like myself who have studied alone and not had the opportunity of talking with other Novices as well as Generals on proper procedure.

Since, as it says in the article, some of the bad habits we learn are hard to break, it might be helpful to get this with the actual Novice license itself.

I wonder if the FCC could be convinced to send it out with the License. It would be recognized as an ARRL article since it is signed by yourself, and would give tips to persons who will be operating on hands controlled by the FCC.

Keep up the good work with QST. — Gordon Knapp, KN8ZAC, Royal Oak, Mich.

QLF, OT!

❖ I am one of those odd creatures that only work c.w. I especially enjoy working the old timers who have been in radio for many years as I find their conversations extremely interesting. However, I find them very hard to copy, not from the standpoint of speed but from the code they are using. I know that it's not my place to correct them as I am a relative newcomer to ham radio but I did get my first telegraph license in 1912.

Many is the time I have wanted to send QSD (or even QLF!) but I like to work these guys and find that they don't appreciate these particular "Q" signals and so I would like to take this opportunity to remind them that just because they have been in the game for many years, their seniority still doesn't make it any easier to copy them. — Ricker J. Bodholdt, K4TDN/3, Phoenix, Maryland.

[Ed. Note: QSD is a bonafide signal meaning "your keying is defective." QLF is a facetious expression generally translated as "Now try sending with your left foot."]

TRAFFIC SPEED

❖ The skepticism of the party who, as reported in "Traffic Topics," July, QST, doubted the validity of W3CUL's traffic totals serves to underscore a significant point: Few phone-type amateurs will believe that record traffic can be handled several times faster on c.w. than on phone.

The party in question based his calculations on an average of eight minutes time required for each message. From what I have observed in listening to phone traffic nets, this is a realistic (or perhaps optimistic) assumption — for phone nets. I have observed over a considerable period of time that the time required per message on a c.w. net averages out at about two minutes. This holds true for most c.w. nets, whether at section, region, or area level. This time includes the time required to establish communication off the net frequency and to sign clear when finished. When three or

more messages are to be passed between the same two stations, the average frequently drops well below two minutes.

The phone man who is truly interested in traffic handling as such might wisely invest a little listening time in the c.w. nets and see how it's done. — Kenneth K. Bay, W4DVT, Wayne, Pennsylvania.

CONGRATS TO EPT

❖ Congratulations on Ed Tilton's new v.h.f. beginner station in July, QST. It's an excellent approach and I am tempted to build one of the receivers myself. — John Chambers, W6NLZ, Palos Verdes, Calif.

[Ed. Note: W6NLZ, with KH6UK, holds the DX record on 144 and 220 Mc.]

TOOL CHEST

❖ "Screws — Nuts — and Things" was a good, informative article. Although most hams probably know most of the information presented in the article, I wonder how many of us always use the right size screwdriver, etc. I cannot deny that many times, when I'm in a hurry, I just grab the nearest tool and work away.

But there is one thing I don't quite understand. What kind of antenna is W6RET using such that when the bolt in the antenna mast fails (Fig. 3), it bends in a direction indicating tension, and not compression, on the mast leg? Does Bill have some kind of lighter-than-air antenna? — Al Brogdon, W4UWA/K9KMO, State College, Pa.

PRACTICAL STANDARD

❖ As a newcomer to amateur radio, I have become very impressed with QST and with the fine work being done by the ARRL on behalf of all amateurs.

My main intention for writing this letter was to offer an opinion regarding the letter of Robert L. Atkinson in the July issue of QST titled, "The Next Step."

As a public school science teacher, I have developed some strong feelings regarding the double standard of weights and measures in use in our country today. From personal experience I have found that the metric system is very easy for anyone to learn until you begin converting from one system to another. Without a doubt this causes confusion and in some cases a rebellion against having to learn a new system which will probably never be of any practical value to the average person.

Robert may be happy to know that Congress has recently appointed a committee to look into the practicability and desirability of the U. S. adopting the metric system as our basic standard. This proposal, of course, has come up before Congress many times in the past fifty or more years, and has been turned down every time. Let's hope we have more progressive minded Congressmen these days who will appreciate the fact that we need a twentieth-century system of weights and measures. — Harold Miglin, WV3ED, Sparta, New Jersey.

❖ Bravo for K8PNH, for his suggestion. I definitely agree that it is awkward to calculate the length of antennas in the English system for wavelengths in the metric system. The formulae for the antenna length ought to be designed for use with the metric system only.

For those in the English-speaking parts of the world who are unable to use the more practical metric system, there could be included in the "miscellaneous data" section of the *Handbook*, formulae and tables for changing from one system to the other.

Another step which ought to be taken is to replace the clumsy unit of capacitance called the "micromicrofarad" with the unit called the "picofarad." The latter is a more

(Continued on page 138)



Operating News



F. E. HANDY, WIBDI, Communications Mgr.
GEORGE HART, WINJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, WIDGL, Ass't. Comm. Mgr., C.W.

ROBERT L. WHITE, WIWPO, DXCC Awards
LILLIAN M. SALTER, WIZJE, Administrative Aide
ELLEN WHITE, WIYYM, Ass't. Comm. Mgr., Phone

Occupancy and Desired Use. A full report on the Board's operational survey of 3.5-29.7 Mc. interest occupies some seven pages of the Officer's Annual Reports. Since these are available as mentioned page 52 July 1961 *QST*, we'll limit ourselves to a few comparisons. The 8,000-card analysis indicates the changing complexion of our operations in 13 years since the last such survey. There was no 21-Mc. band at that time, nor any 7 Mc. phone S.s.b. has come on the scene and constitutes two-thirds of our 14 Mc. phone operating. Also s.s.b. is close to a 50:50 voice use on 15- and 75-meters and comprises 25% of the current 10-meter interest. Today we have considerably less 10-meter utilization than a dozen years ago when, post war, it was the first and only band for all our operating. V.h.f.-interest, then seven percent of all operating, has to-day just about doubled. In summary the following figures, covering all bands except 160, and based on personal expressions of desired-use represent over-all percentages of use:

C.W.....	34.4%	V.H.F.....	12.1%
A.M.....	27.8%	RTTY.....	1.5%
S.S.B.....	23.3%	FM-NFM.....	.3%
Slow-Scan, TV etc..... .6%			

Operational Results vs. Gentlemen's Agreements. In several areas of operation, most amateurs have long profited by promulgating and respecting working understandings. (1) The general understanding by which c.w. operators desist from unnecessary use of the U.S.A. phone band assignments is number one on any

such list. (2) Use of the Novice segments, for other than working Novices, is generally held contrary to ethical operating practice. (3) Suggested RTTY spot frequencies are for the most part adhered to by the radioprinter gang. This gives point to finding each other and consolidates work at points like 3620-, 7040-, 14,090 and 21,090. (*Change from 7140 kc. to 7040 kc. represents an accord reported by W6AEE for international working.) (4) Because of widespread dependence on WIAW for bulletins and code practice, amateurs are asked and generally co-operate to avoid use of announced WIAW frequencies at the periods these activities are scheduled. (5) "Listen before you transmit" is the general rule to be observed by all, to avoid QR'ing or finding yourself snowed, where channels are in use by individual or net operations. (6) THE NATIONAL CALLING AND EMERGENCY FREQUENCIES are listed in every *QST*. To promote an arrangement for the general good, and to meet specific need in time of emergency, amateurs are asked to *tune the spot frequencies often* but to refrain from usage other than specified calling, as per announcement.

(7) USA-Canadian amateurs are requested to keep 14,335-14,350 kcs. clear of any W/VE utilization — so the high end of the band may be available for s.s.b. DX amateurs in all other areas, *that they may work us and each other to better advantage.* Like the successful European band plan and the examples of our other generally known and recognized understandings, this addition to the family of agreements will work only with the best cooperation by all.

It will be a kindness to all groups of operators if amateurs will tell newcomers about patterns which have contributed so much to successful communication results for North American amateurs. Ask their help to enforce the above.

National Calling and Emergency Frequencies. Have you given use of these frequencies a real try-out? Last month's *QST* fully explained how to use them . . . (1) for starting a message and placing it at destination, (2) for finding states for WAS, (3) for specific calling, and of course (4) for emergency attention and use!

Last month we asked your comments on a proposed September-October period dedicated to NCEF use. Did you write? Your ideas would be appreciated. At any rate see the frequency list in this issue and (1) keep a receiver on frequency for NCEF calls; (2) answer calls that may concern you; (3) shift off the NCEF for QSOs after initial contact has been made.



The SEC of Virginia, W4VMA, poses alongside his mobile at the Roanoke hamfest on May 20.

Which Station Appointment? ARRL and your SCM offer individual recognition to appointees in three basic Official Station categories. Every active member-operator, if he does not hold such post already, will (we hope) apply for one of these basic posts along the line of his natural ham inclinations and greatest activity. Qualifications, in addition to being an ARRL member, are indicated in some detail in the booklet, *Operating an Amateur Radio Station*. *Official Relay Station* is our designation for the c.w. appointment mostly identified with 3.5 and 7 Mc. traffic work; the *Official Phone Station* post is for the voice-exemplary and phone traffic net appointee, for the most part in these same h.f. bands. The *Official Experimental Station* appointment recognizes dedicated operating in the v.h.f. net or in propagation reporting as well as some traffic know-how. Perhaps some amateurs have thought one must be in a daily net operation to justify an SCM appointment in one of the three fields. Of course good activity is required. A majority of hams supporting h.f. and v.h.f. nets certainly are eligible, whether so recognized by SCMs or not, but netting is not, as such, a requirement. In each of the basic station posts the idea of appointment is identified with consistent, dependable radio operations, fun and service to each other and outsiders too. Reporting traffic or activity to the SCM is a way to earn his favorable attention. However, appointments do not necessarily require a top volume of message handling; high standards in procedure, dependable performance, and activity are expected. We bring up the subject to invite each active operator to consider his on the air work in the light of one of the three posts. Appointment applications do not go to Hq. but should be sent the appropriate SCM. Your SCM's address is given on page 6, this issue of *QST*.

The ORS and OPS posts are open to Conditional, General, Advanced and Extra Class FCC and equivalent Canadian licensees who meet requirements. FCC or Canadian licensees of *any* amateur class (including Technician and Novice) are eligible for OES, if active at 50 Mc. or above. An SCM certificate is sent each operator appointed and shows his place and dedicated accomplishment in organized amateur work. Condensed station appointment descriptions:

ORS — Official Relay Station. Noted for reliable traffic service, high procedure standards. Includes a 15 w.p.m. c.w. requirement.

OPS — Official Phone Station. For the voice operator; exemplary operating procedure expected. Appointment is identified with reliable traffic work when mainly accomplished on voice.

OES — Official Experimental Station. The post recognizing work in the v.h.f. regions, 50 Mc. and above. May involve reports on propagation data and experimenting, also the support of the v.h.f. nets, traffic handling and individual schedules that build up or demonstrate dependable communications service, for the public or amateur radio itself (as ORS or OPS do in h.f. frequency ranges).

Each is a highly respected ARRL appointment. Unless *already* SCM-certified in one of these fields, your SCM will welcome your application with your activity reports.

Fishing, DX, and DXpeditions. We recently read a bulletin that says there's a flavor and feeling about working amateurs in their homeland that sets such DX apart. It's the parallel for the message handler when we say that his "test message" isn't the same as a *real* one. Anyway, read what K6CQM, editor of the DX'ER has to say about these subjects . . . and credit NCDXC's excellent bulletin for the following:

"Speaking of fishing, has anyone noted the similarities between fishing and DXing? The goal is the same, to catch the elusive ones. You get the thrill of catching a whopper, as you do when you snag rare DX. Both hobbies take getting up early, patient listening long hours for DX, and fishing hours when the fish aren't biting well. Another similarity is the added satisfaction when you work a native DX station instead of a DXpedition in a rare country. It's like catching a native trout, instead of a planted one which anyone can catch. . . . The moral, if any and you're not a fisherman, is to take that up for a little diversification and relaxation."

A relaxed approach, diversity in our radio work too, is recommended. A few minutes a day in a traffic net raises our stock as an all around amateur. Then to be truly versatile, there are items like mobile and v.h.f. in our bag of tricks. Another thing, to count "countries" numerically or traffic *strictly* by the numbers of messages handled never will be as important as the substance of radio contacts, or the people they represent. When one's DX or traffic or contests (any one thing for that matter) get to the obsession stage in that one line, the personal sense of values may warrant re-evaluation.

— F. E. H.

FREQUENCY MEASURING TEST, SEPTEMBER 14 (13th LOCAL DATE)

ARRL invites all amateurs to try their hand at frequency measuring. WIAW will transmit signals for this purpose starting at 0130 GMT Thursday, September 14. The signals will consist of dashes interspersed with station identification. These will follow a general message sent to help listeners to locate the signals before the measurement transmission starts. The approximate frequencies used will be 3506, 7036, and 14,100 kc. About 4½ minutes will be allowed for measuring each frequency, with long dashes for measurement starting about 0136. It is suggested that frequencies be measured in the order listed. Transmissions will be found within 5 or 10 kc. of the suggested frequencies.

At 0430 GMT, WIAW will transmit a second series of signals for the Frequency Measuring Test. Approximate frequencies used will be 3514, 7033, 14,009 kc.

Individual reports on results will be sent to all amateurs who take part and submit entries. When the average accuracy reported shows error of less than 71.43 parts per million, or falls between 71.43 and 337.15 parts per million, participants will become eligible for appointments by SCMs as Class I or Class II OOs respectively.

This ARRL Frequency Measuring Test will be used to aid qualification of ARRL members as Class I and Class II observers. Present observers not demonstrating the requisite average accuracy will be reclassified appropriately until they demonstrate the above-stated minimum required accuracy. Class I and Class II OOs must participate in at least two FMTs each year to hold appointments. SCMs (see listing, page 6) invite applications for Class III and IV observer posts, good receiving equipment being the main requirement. All observers must make use of cooperative notices, reporting activity monthly through SCMs, to warrant continued holding of appointment.

Any amateur may submit measurements on one or all frequencies listed above. No entry consisting of a single measurement will be eligible for *QST* listing of top results. Listing will be based on over-all average accuracy, as compared with readings made by a professional lab.

A.R.R.L. ACTIVITIES CALENDAR

(Dates shown are per GMT)

Sept. 14: CP Qualifying Run — W6OWP
 Sept. 14: Frequency Measuring Test
 Sept. 16-17: V.H.F. QSO Party
 Sept. 20: CP Qualifying Run — W1AW
 Oct. 5: CP Qualifying Run — W6OWP
 Oct. 7-8: Simulated Emergency Test
 Oct. 14-15: CD Party (c.w.)
 Oct. 19: CP Qualifying Run — W1AW
 Oct. 21-22: CD Party (phone)
 Nov. 3: CP Qualifying Run — W6OWP
 Nov. 11-13, 18-20: Sweepstakes Contest
 Nov. 17: CP Qualifying Run — W1AW
 Dec. 7: CP Qualifying Run — W6OWP
 Dec. 16: CP Qualifying Run — W1AW

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Sept. 8-10: Great Lakes Division Convention QSO Party (p. 98, this issue).

Sept. 11: WIN/JM High Speed Code Test, Connecticut Wireless Assn. (p. 76, this issue).

Sept. 16-17: Scandinavian C.W. Activity Contest, NRRL (p. 75, this issue).

Sept. 23-24: Scandinavian Phone Activity Contest.

Sept. 23-25: VE/W Contest, Montreal Amateur Radio Club (p. 25, this issue).

Sept. 30-Oct. 1: VK/ZL Phone DX Contest, W1A (p. 75, this issue).

Oct. 7-8: VK/ZL C.W. DX Contest.

Oct. 21-23: World-Wide RTTY Sweepstakes (next month).

BRIEFS

Contest Notes—V.H.F. Sweepstakes: K2ERQ was incorrectly listed as a multi-op entry; W2YLM operated single-op at K2ERQ for third high score in W. N. Y. Novice Roundup: WA2HEX was incorrectly listed as WA6HEX. High scorer in the fourth district was KN4VRI with 8084 points. WV6MDY is declared S.C.V. winner with a score of 1564-53-23-15.

IT'S NET REGISTRATION TIME

In fact, by the time you read this, net registration and re-registration will already have started. Here are the answers to some pertinent questions regarding the annual net registration roundup, started August 1:

When and how often are nets registered? At least once annually, and every time there is a change in name, frequency, time, or days. After Aug. 1, all nets previously registered must be re-registered. Deadlines for *QST* listings are Sept. 15 for Nov. *QST*, Nov. 15 for January *QST*, Jan. 15 for March *QST* and Mar. 15 for May *QST*. Deadline for the cross-indexed net directory is Nov. 1. One registration between August 1 and Sept. 15 will take care of everything, provided there are no changes. *QST* listings are supplemental, not repetitive unless there are changes.

What nets can be registered? Only nets which are partly or wholly dedicated to a public service, such as emergency preparation or traffic handling. Sorry, we just don't have room for social and rag-chew nets and informal roundtables.

What special privileges does net registration give a net? None whatsoever. The listings are for information only.

Who can register a net? Any net member. However, in order to avoid duplication and confusion, it is best to designate some specific net member (usually the net manager) to do the registering.

On what grounds might a net be disqualified from registration? First and foremost, only amateur public service nets can be registered. ARRL also reserves the right to disqualify registrations that are incomplete, illegible, facetious or for other reasons not a credit to the amateur service.

How will we know if our net meets the requirements for registration? If it appears in the next available *QST* listing, or the printed net directory, it met them. Sorry, we cannot correspond on this subject, generally speaking, nor can we acknowledge receipt of registrations.

What records on nets are kept at ARRL headquarters? We keep a cross-indexed card file. As soon as a net registration is received, the information on it is transferred to a standard 3" by 5" file card, and these are filed alphabetically by name of net. The call of the person submitting the registration and the date on which registered are also included on the card. The name of the net is also entered on a card for that frequency in another section of the file, and again on a card for that state in still another section of the file if the net operates within a certain state. If it is a re-registration, old information is changed by pencil, unless changes are so extensive as to require a new card.

How does one go about registering or re-registering a net? The best way is to get a copy of form CD-85 (see cut), fill it out and send it back to us. This is almost sure fire. Second best is to make a replica of the card on a postcard. Otherwise, listing the information on a separate sheet as per instructions below will do the trick.

(1) **Full name of Net.** What's in a name? Not much, but if it takes more than a line of space in a *QST* column, that's too much. Most long net names have at least 50% unnecessary words. How about shortening them?

(2) **Net designation.** You don't have to have one, but if you do, let us in on it. Examples: CN for Connecticut Net; BEN for Badger Emergency Net.

(3) **Frequency, or frequencies, in ke.** If more than one frequency, be sure the time and days of operation on each are clear. Frequency bands or segments are not sufficient.

(4) **Days.** Tell us which days, not how many a week or "all." "Daily" means every day, including Sunday. Make sure your days of operation are in accordance with GMT.

(5) **Call of Net Manager.** The amateur who runs the net, writes correspondence or is the one to see about it. Please use the amateur call, not his name.

(6) **Net starting time(s).** Net ending time(s). Use Greenwich Mean Time (GMT). If you don't, we'll convert it for you. In any event, make sure the days agree with the times.

(7) **Direct Coverage.** The coverage afforded by the net stations themselves, or the coverage area assigned the net. Do not include liaison with other nets.

(8) **Purpose of Net,** if not indicated by name. Indicate traffic, emergency, or other public service purpose. Don't say training without indicating training in what.

(9) **NTS?** Is this net part of the ARRL National Traffic System?

(10) **Liaisons.** If an NTS net, indicate your NTS liaison. If not NTS, the other nets with which regular liaison is maintained.

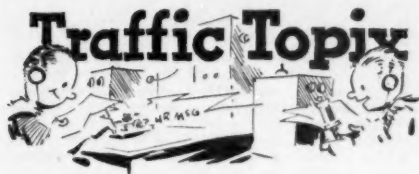
(11) **Previously registered?** Just yes or no. This will save us a little time in searching through the files. If you remember the approximate date of the last registration, this will help even more.

(12) **Call letters of amateur submitting this information.** Any questions? Please write legibly (or type).

NET REGISTRATION

Name of Net.....	.....
Net Designation (if any).....	Freq.....Days.....
Mgr.....	Starts.....Ends.....GMT
(Call)	
Direct coverage.....	.....
Purpose of Net.....	.....NTS?
Liaisons.....	.....
Previously registered?.....	Submitted by.....
	(Call)
CD-85 (Rev. 7/61)	

Sixteen-year-old K3ESS recently received a letter of commendation from Abbott Laboratories in Chicago for his part in obtaining a critically-needed drug for a patient in a foreign country.



We hate to belabor this subject, but we keep on getting complaints about traffic that is garbled and traffic that never gets to its destination.

Even though it is certainly true that most messages are delivered accurately and in good time (but we never hear about them), an accuracy or delivery percentage of 51% or 75% or even 99% is not good enough. It is becoming more and more obvious that too many of us are too preoccupied with "clearing the hook" and running up high traffic totals and demonstrating our superior copying ability, and not enough concerned with making sure the traffic is copied and transmitted accurately and moved with precision and efficiency toward its destination.

If this is an indisputable fact, what can we do about it? Preaching (we've done plenty of this) doesn't seem to accomplish much. A number of other thoughts occur. We could run a "black list" of amateurs known to have copied inaccurately or failed to deliver—if we could prove it. We could offer prizes or certificates or special honorable mention to those who are known for their accuracy and efficiency, if we could be sure who they are. Or, we could run a continuous series of test messages and announce results, complete with calls, from time to time, if in doing so we didn't run afoul of the "secrecy of communications" provisions of the Communications Act. Maybe you can think of some other methods for putting "teeth" into our rules for accuracy and responsibility for ultimate delivery.

The Communications Act, once you sort out all the complicated wording, provides that it is unlawful to divulge the "existence, contents, substance, purport, effect or meaning" of any message except to the addressee, unless authorized to do so by the sender. This is stated in about 350 words in Section 605 of the Communications Act of 1934. Even the legal experts cannot agree on precisely what this section means. To be on the safe side, we'll just assume that we would be violating no law if we just get the sender to find out when the message was delivered and in what condition, and let us know so we can make a running check on our traffic handling efficiency. If we can ascertain the routing it took and the handling data of each relaying station, and where any garbling took place, so much the better—but again, it has to be the sender (i.e., the originator, the person who signed the message) who permits this, and relaying stations would be perfectly within their rights to refuse to provide the information desired.

So we need some volunteers. In order to make a useful test, little if any of the traffic should be originated from WIAW, WIBDI, WINJM or any other member of the headquarters staff, or from field ARRL officials. In any case, the test traffic should be fiendishly ordinary—that is, it should not be addressed to an amateur, it should contain an ordinary address and signature, and there should be no indication at all that it is a test message, so it will receive ordinary handling, be this good or bad. Just a plain, ordinary, run-of-the-mill message from a member of your family or a friend to Aunt Susie in West Pokonoke. Send Aunt Susie a postcard asking her to let you know when she got it and send you a copy of the message as she received it.

In order to steer clear of legal complications, don't send us the message. Just give us these facts: (1) The date of origination and the date of delivery. (2) The extent of garbling, if any. (3) Into what net it was originally sent, or if it was originated to a single station outside a net. (4) The



identity of the delivering station, if known. Other information you care to give, such as the apparent cause of delay, reasons for garbling, etc., can be thrown in.

One thing be sure to remember: we want to hear about it whether it is good or bad. In other words, if you do originate a test message, make sure you report the results to us; otherwise, we'll hear only about the ones which were outrageously delayed or garbled. We want to hear about 'em all.

One other thing: let this not be a signal for all of us to originate junky test messages. We don't want to clutter up

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for June Traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	288	2296	1859	437	4880
W6YDK	1952	153	100	41	2179
W9JOZ	18	1099	1089	10	2216
K6BPI	80	884	811	73	1848
W3IVS	9	727	713	14	1463
K3IMP	681	377	302	27	1387
K2UTV	5	600	570	27	1202
W3EML	18	519	582	25	1144
K4AKP	5	556	523	33	1117
W7BA	162	503	426	12	1103
W6WPF	23	523	511	12	1069
K4AKP	41	485	453	29	1008
W6GYR	444	269	257	5	975
K8ONK	121	410	438	5	974
WSDAE	42	417	320	75	854
W7DZS	5	425	374	44	848
K9OZM	14	400	310	89	813
W3VR	49	391	327	16	783
W6LVX	30	375	328	22	755
W4PL	11	374	344	23	752
W3WRE	29	336	322	10	697
W4GGOZ	33	332	327	3	695
W4UPH	10	334	267	65	676
W6EOT	8	344	296	27	665
W9DYG	36	308	237	42	623
K5QWR	28	286	272	20	606
K4JSH	70	315	209	9	603
W1SMU	19	298	261	23	601
W6GKK	0	293	293	0	586
W2EZB	14	284	246	19	563
K4POL	3	261	255	5	524
W0ISJ	16	251	247	9	523
K4ZYI	47	213	240	15	515
W6ROF/K6CLS/6	26	255	219	12	512
K0WWD	115	192	156	46	509
Late Report:					
W6FCO (Mny)	407	1439	1403	36	3285

More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W6IAB	97	2864	2840	24	5825
W4PFC	520	347	249	14	1130

BPL for 100 or more originations-plus-deliveries

W4FOR	209	K6GZ	142	K3JYZ	111
W9DQL	197	W8BZX	135	K4HQV	107
K8AAG	192	K3IPA	126	K9ISP	106
K4FPZ	170	W2GKZ	122	KH6DVG	106
W2EWF	159	K3IPK	121	W42CCF	103
K0VTG	159	K6GK	120	KP4WT	103
K9RMI	149	W9NZZ	118	Late Report:	

BPL medals (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: W2GKZ, K5USE, W6LVX/6, K8AAG, W6FEO.

The BPL is open to all amateurs in the United States, Canada, and U. S. Possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

the air with them. Whatever you do, don't forget to get the permission of the originator of the message to use it for test purposes, and get it in writing if the originator is not you.

What good will this do? Well, for one thing it may make some of these guys conscious of their accuracy; they'll never know when the message they are handling is a test message, and so they'll take a little more care with all of them. Also, we'd like very much to be able to prove that we're not so bad as some of us think we are. On the other hand, if we're worse we ought to know that too. — WINJM.

June net reports.

Net	Sessions	Check-ins	Traffic
7290 Traffic	46	1420	681
Eastern Area Slow	30	87	21
Early Bird Traffic	28	—	96
Northeast Area Barnyard	26	723	2
20 Mtr. Interstate SSB	21	531	1512
Wolverine	—	852	151
Interstate SSB	—	681	300

We quote from "AEN," the Officials and Net Managers Bulletin of the Alabama Section: "When you accept a net control assignment, you are morally obligated to be there on your night unless something comes up to prevent it. When you do have to be absent, 90% of the time you will know it a day or so beforehand. Send your alternate a message (not your net manager) notifying him of your intended absence. Of course, you should not need to notify your alternate, but it helps him to know for sure you will not be there and he can go ahead with the net at the appointed time. If you are an alternate NCS, be there just as if you were net control, and if the regular NCS does not start the net at the appointed time, go ahead and start the net within 3 minutes. If you are a liaison station, be there on your appointed night, or if you have to be absent notify your liaison captain or another station to take your place. Be reliable!" — K4AOZ.

National Traffic System. One of our region net managers brought up a point that we don't think has ever been expounded upon, incredible as this may seem. Actually, he was complaining that one of his sections was not being represented regularly in his net and therefore dragged down his net's standing, and wondered if he sent a station to that section's net with their traffic, could this count as representation for that section.

This is a good point. In cases such as Hawaii, Alaska, the West Indies and the Canal Zone, it is permissible procedure for the region net manager to designate certain stations to perform the liaison out of net, because these outlying sec-

tions cannot usually report directly into the region net. Why can't the same procedure be used for sections that don't send regular representation to their region net? For example, there are lots of Ohio stations available in SRN, but West Virginia frequently does not supply a representative — why can't the region net manager designate an Ohio station to take West Virginia traffic and report into the West Virginia net with it?

We see no reason why this is not a perfectly allowable procedure. However, there is one clincher. Liaison, to be effective, must be liaison both ways; that is, both to and from the section net. If the region net manager (or NCS) finds no representation from a particular section and designates a volunteer to take traffic to that section, the liaison is only one way, only half the full liaison. To make such liaison complete, the designated station should report into the section net before the region net meets to get "thru" traffic to bring to region, as well as to get traffic for that section from the region net and take it to the section net. If this is done, the liaison will have been completed.

Therefore, section net managers who are unable to supply liaison to their region nets should so advise the region net manager. If the latter has any volunteers available, he may be able to help with your NTS liaison. However, this is primarily the section net manager's responsibility. We are willing to give credit for liaison performed, no matter by whom, but sections should aim at standing on their own feet, and any other arrangement should be considered temporary. Also, where liaison is only one way, it should be counted as only one-half liaison for that session.

This sort of arrangement might help in some regions where a net manager has an excess of eager beavers in one section but a dearth in another. Put 'em to work!

June reports:

Net	Sessions	Traffic	Rate	Average session	Representation (%)
1RN	58	769	.403	13.3	70.2
2RN	59	550	.493	9.3	91.5
3RN	60	1158	.535	10.3	100.0
4RN	60	873	.410	14.5	88.4
5RN	60	557	.319	9.3	77.1
6RN	60	452	.253	7.5	42.9
8RN	59	317	.178	5.4	70.5
9RN	60	903	.639	15.1	74.5
TEN	77	1087	.534	14.1	55.5
ECN	22	86	.180	4.0	62.1 ¹
TWN	30	392	.421	13.1	88.7 ¹
EAN	28	1330	.863	47.5	98.2
CAN	30	1380	.886	46.0	100.0
PAN	30	1140	.757	38.0	98.9
Section 2	1172	6471		5.5	
TCC Eastern	102 ³	606			
TCC Central	90 ³	1058			
TCC Pacific	108 ³	815			

Summary	1865 ⁴	19944 ⁴	CAN ⁴	9.4	3RN/CAN
Record	1676	19178	.857	15.9	100.0

¹ Region Net representation based on one session per night. Others are based on two or more sessions per night.

² Section nets reporting: SCN & NCN (Calif.); BUN (Utah); QKS (Kans.); WIN & WSSN (Wis.); MDDS (Md.-Del.-D.C.); RISP (R.I.); CN & CPN (Conn.); NJN (N.J.); PFN (Pa.); NTX & NTTN (Texas); WSN (Wash.); VN, VFN & VSN (Va.); SCN (S.C.); AENT, AENP Eve, AENO, AENP Morn, AENM, AENB (Ala.); MJN, MSN, MSPN Noon, MSPN Eve (Minn.); GSN (Ga.); CCW (Colo.); GBN (Ont.); WFPN Eve (Fla.); OSN (Ore.); KYN (Ky.); NJQ, SDN & S.D. 75 Phone (So. Dak.); Tenn. CW.

³ TCC functions reported, not counted as net sessions.

⁴ A new June record. Record indicated is previous record.

Thanks mostly to section net reports, we again broke a number of records in June. Thus, the progress of NTS continues from year to year despite the downgrade in the sunspot cycle — although conditions during the month weren't half bad, considering.

W2EZB announces that on July 1 2RN started a two-session schedule at 2300 and 0230 GMT, with a full duty roster, including alternates. W3UE reports that 3RN is still going great guns with a wealth of qualified personnel, having reached five consecutive months of 100% representative from sections. W4FOR has received a 4RN certificate for



Steuben County AREC provided communications for the Memorial Day parade last May. Here W9CFG looks over the shoulder of EC W4CTU/f9 as they go over parade plans.

outstanding performance as EAN liaison. Representation was bad on RN5, QRN causing great difficulty; college boys on summer vacation are helping as NCS. West Virginia has been falling off on 8EN; W5DAE has completed one year as net manager. TEN is suffering from summer vacations and poor band conditions, but hopes for better performance in July. W0FEO has been under the weather, but is back in action again. EAN, under its "silent manager," just keeps rolling along, like Old Man River. CAN is using forty meters occasionally for QNY purposes when conditions are bad. The new call of the PAN manager is W6GROF, but the change is in call only; he was formerly K6CLS/6; his monthly bulletin contains some FB advice for net stations.

Transcontinental Corps, June reports:

Area	Functions	% Suc- cessful	Traffic	Out-of-Net Traffic
Eastern.....	102	88.2	1721	606
Central.....	90	94.4	2132	1058
Pacific.....	108	95.4	1017	815

Summary..... 300 92.7 5470 2479

The TCC roster: Eastern Area (W1SMU, Dir.) — W1s AW EMC NJM OBR SMU WEF, K6s SSX UFT, W4APY, W2RXL, K3IMP, W7s FAF WRE WG, W4DWT, W7s ELW UPH, VE2AZI/W1, VE3CWA. Central Area (W0BDR, Dir.) — K4AKF, W7s CXY DO DYG KQB ZYK, W7s BDR LCX SCA. Pacific Area (W6EOT, Dir.) — W5ZHN, K6s ZYZ QPH KCB GID LKD, W7s EOT HC, W4s ROF ECF LVX, W7s GMC DZX, K6s EDH EDK IIT, W7s WHE/7 WME KQD.

DXCC NOTES

Announcement is hereby made of the addition to the ARRL Countries list of KUWAIT/SAUDI ARABIA NEUTRAL ZONE. This Neutral Zone is located between Kuwait and Saudi Arabia and encompasses territory over which the sovereignty has not been established. DXCC credit claims may be made for this addition starting November 1, 1961. Only confirmations for contacts with stations which have had specific written permission to operate from this Neutral Zone by either Kuwait or Saudi Arabia will be accepted for DXCC credit. Confirmations for contacts with the Kuwait/Saudi Arabia Neutral Zone must be dated November 15, 1945 or later. DXCC credit claims for this addition received before November 1, 1961 will be returned without credit.

CORRECTION: With reference to the DXCC Note of August 1961 QST (p. 78) regarding the addition to the Countries List of Damao and Diu, inasmuch as Point 3 of the criteria calls for the separation of 75 miles of foreign land, Damao and Diu cannot be considered as two listings but rather as one. Damao and Diu will be considered as separate from the Goa listing by virtue of Point 3 of the criteria. Credit claims for this addition may be made starting October 1, 1961.

DX CENTURY CLUB AWARDS

HONOR ROLL

W3GHD.....311	W8BRA.....308	W8BF.....304
W4DQH.....311	W3KLT.....307	W3BES.....304
PY2CK.....311	W9YFV.....307	W6ENV.....303
W3JNN.....311	W5ASG.....307	W4TM.....303
W8JIN.....310	LUGDJX.....306	W9HUZ.....303
W2ACW.....310	C3AYG.....306	W7LLX.....302
W6AM.....310	W7GUV.....306	W1BHH.....302
K4VAA.....309	W8BKP.....306	4X4DK.....302
W2HUQ.....309	W3GRW.....306	W2RMJ.....302
W6CUK.....309	W5ADZ.....305	W1JYH.....302
W1GKK.....308	W6EBG.....305	W0ELA.....302
W8MDM.....308	W8UAS.....305	W9LNM.....302
W9RBI.....308	W1ME.....304	W8KIA.....302

Radiotelephone

PY2CK.....311	VQ4ERR.....302	W7PHO.....296
W8GZ.....304	W8KML.....299	W6AM.....295
W3JNN.....303	4XADK.....299	Z86BW.....294
W8BF.....303	CX2CO.....299	W4DQH.....293
W9RBI.....303	W6YY.....296	ZL1HY.....292

From June 1, to July 1, 1961 DXCC Certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

SP4JF.....164	DL1BG.....105	YU3IB.....101
W4KKB.....146	W4ZM.....104	W1KBN.....100
PA0HT.....124	G3CHJ.....104	WAZHUW.....100
ZD2GUP.....120	DJ2SR.....104	W3IWS.....100
DL6FF.....112	OD5CN.....104	W4UFI.....100
K2SQM.....111	K2JUA.....103	K5YNA.....100
W3HNI.....111	UM8KAB.....103	W6AJB.....100
UR2AT.....111	VU2AK.....103	W6HPS.....100
YU1KA.....110	W4G8J.....102	W8FRM.....100
W9AFX.....109	Z87M.....102	VE6IN.....100
UA9DT.....108	W2OQS.....101	KP4AQQ.....100
UD6KAB.....106	EA9AQ.....101	FJ2AE.....100
	0Y8RJ.....101	

Radiotelephone

W4KKR.....132	KH6DLD.....104	Z86YB.....101
W3YZI.....119	W9YMZ.....103	K0RDP.....100
F8BO.....108	Q3NRZ.....103	DJ2VZ.....100
W3CLF.....105	K8DYX.....102	FJ2AC.....100
W0QLX.....105	KI1NO.....101	JAIAT.....100
W1QJR.....104	W9VNG.....101	JACCY.....100

ENDORSEMENTS

W3ECR.....292	W1QJR.....233	W9ERU.....232
W6CYV.....291	W2GNQ.....231	W9WIO.....232
W2ZX.....290	W4ECL.....250	W3KFK.....230
W9FJB.....285	W2RDD.....250	W6FJR.....230
W2LAX.....280	W4DKP.....250	W4BJJ.....229
W0QGL.....273	W8WT.....242	K8BGT.....223
W1BLL.....270	VE2YU.....240	W1QMM.....222
K6KIL.....270	QY7ME.....240	W7ZS.....222
W9QJR.....270	VE3DKY.....239	W7ZAS.....221
W2IRV.....263	W0TJ.....236	LU5AQ.....221
W4YWX.....259	W1BGW.....233	W1OHA.....220

W9LTR.....219	K3ESW.....180	W2OCL.....141
W8PHZ.....218	K6VVA.....180	W3YZI.....140
K9ATZ.....214	W7UMJ.....180	W8ETU.....140
W1WLW.....213	W8KMD.....180	K8KYZ.....140
W8KBT.....213	W5TJ.....179	W0RZU.....140
DL1DC.....213	K0BTE.....173	K9IAD.....133
W2RA.....212	HZ1AB.....173	W4HUE.....132
W4CKB.....211	K2DHN.....172	W6HVN.....132
K4VCW.....211	W9WNB.....172	K8MTI.....132
W2BHM.....210	W6ABA.....171	W4ZCB.....131
K0GXR.....210	LU5ABL.....171	W7STC.....130
W5ARJ.....202	PABOI.....171	F9EP.....130
W0DAO.....202	W4RW.....170	K2BG.....129
K0RAL.....202	W8BIE.....170	W2KHT.....127
K3DCI.....201	W4BDA.....169	SM7CAB.....123
W9MGI.....201	VE1EK.....169	K9QH.....122
K4ASU.....200	W8HEV.....161	K9JLR.....122
W4MCM.....200	W4TK.....160	KW6DG.....122
W5TTN.....200	K4ZKZ.....160	W5JPC.....121
W90AQ.....200	W9PCF.....160	U4SHK.....121
K8KAE.....198	K4JEY.....156	K4ZYU.....120
W0EWH.....193	K9HOL.....155	K3UYF.....120
W2ZY.....190	W6NQ.....153	VR2DK.....120
W08NL.....190	K9GVE.....153	Z86AJ.....117
PA0VO.....190	W4LCY.....151	W2JKH.....115
W9TKD.....184	W2MOF.....150	W7MH.....112
W3PN.....182	W2NIV.....150	K0UHH.....111
W5EJT.....182	W2YLS.....150	W2TKG.....110
K8DYX.....182	K2XYL.....149	W8LUZ.....110
OB2YV.....182	W1QQV.....146	W0LQG.....110
K1TFJ.....180	SP1JV.....146	K9ORC.....110
W2DEO.....180	Z81NQ.....145	W9YMZ.....110
	SP8HR.....142	

Radiotelephone

W6GVM.....280	W5RNG.....181	CX2CN.....150
W3ECR.....261	W9JAV.....180	K4CKZ.....148
W60BH.....251	W8QNF.....178	K48TY.....144
W2WV.....245	OY7ML.....177	W0LW.....140
T12LA.....231	K9ATZ.....170	K0EWL.....136
W5ASG.....230	W7ZAS.....172	K1BDP.....130
W40M.....220	K9ECE.....171	K0RAL.....130
W9HP.....200	K1EJO.....169	K1EJO.....130
ZP5EC.....198	W0LTR.....169	W7UMJ.....122
K2JGG.....191	W9TJ.....163	W2MOF.....120
W2TF.....187	G3MGN.....162	K5LAC.....120
W3ICQ.....181	SP7TH.....161	Z86AHW.....120
		VE5QR.....113

U. S. Canada Call Area and Continental Leaders

KH6CD.....261	VE3DF.....284	VE8AW.....195
KL7PI.....261	VE4XO.....280	Z86BW.....294
VE1PQ.....260	VE8RU.....220	G3AAM.....300
VO1DX.....255	VE6NX.....256	G4CP.....300
VE2WW.....285	VE7ZM.....300	ZL1HY.....301

Radiotelephone

W1FH.....289	KL7AFR.....190	VE4RP.....102
W2BXA.....283	W0AIW.....283	VE5RU.....203
W2ZX.....283	VE1PQ.....166	VE8TF.....181
W5BGP.....265	VO1DX.....141	VE7ZM.....270
KH6OR.....261	VE2WW.....231	IIAMU.....274
	VE3QA.....241	



All ECs and AREC members are asked to note that the Annual Simulated Emergency Test is scheduled to be held on October 7-8. Start planning now. The SET Bulletin should reach ECs some time in September.

On May 15 WA2QWY/mobile spotted a fire on Route 3, ten miles west of Plattsburgh, N. Y. He reported this to K2VXR, who set up an AREC net on 146.82 Mc. with WA2RLW and WA2IOH/mobile. WA2IOH/mobile went to the scene of the fire and offered communications aid to the firefighters. Communication was maintained with K2VXR for over two hours. — WA2GCH, EC Clinton Co., N. Y.

The Steuben County (Ind.) AREC swung into action on June 6 when it responded to a drowning at Fox Lake. Communications were established between the boats that were searching for the body and the officers on shore. K1CMT/9 went in one of the search boats with a hand-carried unit while W4CTU/0 operated mobile on shore on 52.525 Mc. Responding at the scene of the drowning were W9s BBX BFT and BGY. — W4CTU/0, EC Steuben County, Ind.

On June 9 and 10, AREC members in Kentucky set up a network to handle traffic in and out of tornado-stricken Ravenna, Ky. Frequencies used were 3600 kc. and 3960 kc. W4JSH/4 acted as net control from the armory. Telephone service and electric power were both disrupted by the tornado, necessitating emergency power from W4JSH/4 until late on June 10th. Over sixty messages were handled for the Red Cross and civil defense. Also operating from W4JSH/4 were K4s EZB and CSG. The following additional stations are mentioned as having taken part: K4s JXL KWO CHY CSH VDN UVJ UNC ECJ OLT MZW MIQ LXA GAG QPB IHE QHZ, W4s TKH HEA ODK BAZ BDC JTB WNF YYI SYE SZB TYP VNJ, W8s VTC SQF HQK. — W4JSH, EC Lexington, Ky.

On July 12, amateurs of South Okaloosa County, Fla., were asked to assist in a search for two lost children, aged 9 and 7. The ten-meter net was activated at 0230Z with W1RKH as NCS. Contact was maintained from the control station with both the sheriff's office and the air force which was also participating. Amateur operators in their mobile units cruised the streets of the various housing areas and checked local theaters and other amusement and refreshment places, and ran down other leads as they were called in. The children were found unharmed about eight miles from their home. Mobiles participating were K4s JSJ LOL MTZ, W4s IQK and MMW.

On June 15, EC WA6BFC of Arcadia and vicinity, Calif., along with assistant ECs WA6OUK and WA6EXR, decided to set up communications in connection with the forest fire raging in the San Gabriel Mountains. WA6GDF and WA6BFC proceeded in their mobiles to the vicinity of the fire and set up a station at the side of the road. Contact was lost with WA6OUK, but K6SIY relayed all traffic to WA6OUK, who then relayed to the So Cal 6 Net. The station was closed down at 0330Z because of QRM and time was devoted to non-communications tasks. The following night, however, they were back on the job by 2400Z handling traffic from the fire zone to roadblocks advising them of the overall situation and which routes residents were to use. WA6BFC notes the following calls of additional mobiles who took part: K6s ZWR YDJ IWV. Other stations participating were W6s MWM MWN PGZ MWP, WA6s EXR PDB MVH MOJ CHC.

On June 17, while the London, Ont., AREC was handling communications for the Model Flying Club near London, one of the planes got out of control and plunged into the crowd, injuring a spectator. VE3CFR immediately contacted VE3CRG in London who promptly summoned an ambulance and police assistance. The group received excellent publicity for their efforts. — VE3CFR, EC London, Ont.



During the Ravenna (Ky.) tornado disaster of June 9, 1961, W4JSH (seated) and K4EZB set up this control station on the second floor of the Armory.

On June 19 and 20 an emergency was created by high water and an impassable bridge between the U. S. and Mexico at Del Rio, Texas. XE2LR and XE2LI operating mobile station XE2PAY could not get across the river to a proper location for operating, so they crossed at Laredo and came up to Del Rio on the U. S. side, operating with special FCC permission, which had also declared 7275 to 7285 kc. an emergency freq. Other amateurs involved were XEs 2CY 2SO 2PAG 2DS, K6s OFR HZR RGT TRY, W3s LOB ABB VW. — W5AIR, SEC So. Texas.

The Central Texas Emergency Net was alerted on Sunday, June 11, to assist in intercepting a party on his way though Texas from a vacation in Colorado to his home in Louisiana. It was necessary to inform him of a death in his family. All police departments were given a description of the car and driven by CENTEXEN members, and the sought-for party was finally located in Houston. Thanks to the action of CENTEXEN, he was able to reach home in time for the funeral. — W5BOO, Mgr. CENTEXEN.

May reports were received from twenty-nine SECs, representing 13,084 AREC members. This doesn't come up to last May's 33 reports, but beats by over a hundred the membership represented. Missouri and West Virginia submit their first reports for 1961, bringing the total different sections to 42 this year. Other sections reporting: So. Texas, Va., NYC-LI, Ore., E. Mass., Maine, Kans., Ind., Santa B., Ohio, Wash., Iowa, N. Texas, So. Dak., Nevada, Utah, Ga., E. Bay, E. Pa., Sac. Valley, Colo., E. Fla., Mich., N. N. J., W. Fla., Md.-Del.-D. C.

RACES News

We have two late OPAL reports, picked up from club bulletins. From the *Tri-Town Oscillator*, we learn that amateurs participated in OPAL in Blue Island, Ill., in what was



characterized by W9GAY, C.D. Director of Communications, as the "best test of all." At a word from the Chief of Police, who opened the sealed envelopes on instructions from the c.d. director, the entire c.d. corps was activated, including the eight amateurs who donated their time and equipment to help make the test a successful one. One amateur cruising in the area volunteered his services and was pressed into service quite successfully. Some difficulty was experienced in making liaison with the telephone company's facilities. The band used was 100 meters, but a move to 2 meters is contemplated.

The report from Cedar Rapids, Iowa (W6GQ) is not quite so rosy. The station at City Hall simply could not receive the state control station during daylight hours. W6GQ says that existing frequency assignments result in unbelievable QRM from bordering states. More six-meter activity is needed; there is plenty of equipment but little of it is licensed for RACES.

SUGGESTED RTTY OPERATING FREQUENCIES

3620, 7040, 14,090, 21,090 kc.

WIAW SCHEDULE

(Sept. 1961)

(All times given are Greenwich Mean Time)

Operating-Visiting Hours:

Monday through Friday: 1700-0500 (following day).

Saturday: 2300-0630 (Sun.). Sunday: 1900-0230 (Mon.).

Exception: WIAW will be closed from 0230 Sept. 4 to 1700 Sept. 5 in observance of Labor Day.

A map showing how to get from main highways (or from Hq. office) to WIAW will be sent to amateurs advising their intention to visit the station.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules.

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,700, 145,800.

Phone: 1820, 3945, 7255, 14,280*, 21,330, 29,000, 50,700, 145,800.

Frequencies may vary slightly from round figures given; they are to assist in finding the WIAW signal, not for exact calibrating purposes.

Times:

Monday through Saturday, 0000 by c.w., 0100 by phone.

Tuesday through Sunday, 0330 by phone, 0400 by c.w.

General Operation: Use the chart on this page for times and frequencies for WIAW general contact with any amateur. If local times are used, the operation between 0000 and 0500 each day will fall in the evening of the previous day in some U. S. and Canadian time zones.

Code-Proficiency Program: Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Tuesday, Thursday and Saturday, and at 5, 7½, 10 and 13 w.p.m. on Monday, Wednesday, Friday and Sunday are made on the above-listed frequencies (except 1820 kc.). Code practice starts at 0130 each day. Approximately 10 minutes' practice is given at each speed. Exception: No code practice on Sept. 5 (Labor Day) and Sept. 14 (FMT). On Sept. 20, instead of the regular code practice, WIAW will transmit a certificate qualifying run.

* Single sideband.

GMT CONVERSION

To convert to local times subtract the following hours:

ADST -3, AST -4, EDST -4, EST -5, CDST

-5, CST -6, MDST -6, MST -7, PDST -7,

PST -8, Honolulu -10, Central Alaska -10.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. — 3535, 7050, 14,000; phone — 3765, 14,160, 28,250 kc.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from WIAW will be made Sept. 20 at 0130 GMT. Identical tests will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted Sept. 14 at 0400 Greenwich Mean Time on 3590 and 7129 kc. **CAUTION:** Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given. *Example:* In converting, 0130 GMT Sept. 20 becomes 2130 EDT Sept. 19.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code-practice transmissions are made from WIAW each day at 0130 GMT. Approximately 10 minutes' practice is given at each speed. Reference to tests used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of QST text sometimes is reversed. To improve your fist, hook up your own key and audio oscillator and attempt to send in step with WIAW.

Date Subject of Practice Text from July QST.

Sept. 6: Sporadic-E Warning Service . . . p. 19

Sept. 9: A Complete Two-Band Station . . . p. 12

Sept. 12: Understanding Tetrode Screen Current, p. 26

Sept. 22: Plate Modulation for the . . . Transmitter, p. 22

WIAW GENERAL-CONTACT SCHEDULE

WIAW welcomes calls from any amateur station in accordance with the following time-frequency chart.

Time (GMT)	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0000-0030 ¹	14,280	3555 ³	14,100	14,100	7080 ³	14,100
0030-0100	14,280	3555	14,100	14,100	7080	.....
0100-0130 ¹	145.8 Mc.	21,330	145.8 Mc.	50.7 Mc.	21,330	.....
0230-0300	1820	.....	1820	.....
0300-0330	3555	.....	3945	.....
0330-0400 ¹	3945	7255	3945	7255	3945
0400-0500 ¹	3555 ³	.....	3945	7080 ³	.....
1700-1800 ²	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	.....
1900-2000	7080	14,100	7255	.....	7080	.....
2000-2100	14,280	7080	14,100	14,280	14,100	.....
2200-2300	14,280	14,280	14,280	14,100	7255	.....
2300-2330	7255	.....	21,075 ³	.....	14,280	.....
2330-2400	14,100	.....	3555	.....	14,280	.....

¹ Starting time is approximate. General-contact period on stated frequency begins immediately following transmission of Official Bulletin, on c.w. at 0000 and 0400, on phone at 0100 and 0330.

² Operation will be on 21,075, 21,330, 28,030 or 29,000, depending on band and other conditions.

³ WIAW will listen for Novice Class licensees on the Novice portion of this band before looking for other contacts.

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Brein-er, W3ZRQ—SEC: DUL RM: AXA, Pam: IVS. A grand and enjoyable time was had by all at the Eastern Pennsylvania Section Picnic on June 18. New gear dept.: K3DSM is sportin' a new Heath Warrior, K3IPK has an HQ-170, IVS is s.s.b. on an HT-32A. His jr. operator is K3PFLI. CUL chopped the end out of their trailer to install the new KWM-2. YPF has an AT-1 in operation. IDL has a new 10-meter ground, K3AVX put up an 80-meter antenna to "eaves-drip" on the activities of the SCM and the PFN. VFJ is the call of the Susquehanna Valley ARC. JSX is installing a break-in system, Salem County, N.J., is needed by HNK for the WANJ Award. K3GOF is now General Class and planning on s.s.b. operation. NNL spent hours getting the s.w.r. down, now can load the transmitting rig. BNF has 35 awards from 15 countries and 5 continents, all on 10-meter phone. K3ANU is attending Temple U. and FCI will be a junior at Penn State College. K3HTZ complains he cannot get as many to QNT the EPA Net since he cleared the v.f.o. drift. WQEX and jr. operators WAJBS and IIS are now in Lancaster. IIS is a 12-year-old YL. New gear dept.: West Branch ARC—SEC: KNG, pres.; K3GSM, vice-pres.; K3MKV, pres.; K3-ADZ, treas. Delmont RC—K3HJC, pres.; K3DEY, secy.; K3GAG, treas. Hometown ARC—K3ELC, pres.; K3HFV, vice-pres.; K3NMUK, secy. 307 Society—K3IPA, pres.; K3LSI, vice-pres.; K3KKV, secy.; K3-MNJ, treas. Short Skip RC—21LN, pres.; K3AWD, vice-pres. ZOP, secy., ZPX, treas.; DVB, asst. mgr. Mt. Airy RC—AXU, pres.; K3IUV, v. pres.; 2EIF, secy.; MVF, treas. Fifty-three League affiliated clubs are recorded at this office. Eleven Field Day messages were received by the SCM; a pretty good average, however only 3 were received by amateur radio. This leaves plenty of room between 3 and 53. Hats off to the Eastern Pennsylvania Section Picnic which was bigger and better than ever. The committee: K3BHU, secy.-treas.; IVS, toast master and vice-chairman; DGX and K3-CAH, prizes; GEU and K3NZD, registration; ZRQ, chairman. Traffic: W3CUL 4880, IVS 1463, K3IMP 1387, W3EML 1144, VR 783, HNK 300, K3HWX 246, W3FAF 167, K3IPA 148, IPK 142, W3UIU 95, AXA 93, W4DVT 60, K3HTZ 74, BHU 64, W3NNL 56, K3JXN 46, KNL 23, CAH 21, MNT/3 10, W3EAN 16, K3MVO 13, W3-BFF 12, JXN 12, K3KZG 12, W3NOB 10, OY 10, K3KFD 8, DSM 7, W3BNU 6, BUR 6, K3CNN 5, ANU 4, JJG 4, W3FCI 3, K3KEL 3, W3KMD 3, K3LNM 3, W3GYP 2, K3JLW 2, NZD 2, W3EU 1, K3GSU 1.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3BKE—SEC: CVE. MDD Traffic Net meets at 1915 EST Mon.-Sat. on 3650 kc.; MDDs (slow) Net at 2030 EST daily on 3650 kc.; MEPN (phone) Mon.-Wed.-Fri. at 1800 and Sat.-Sun. at 1900 EST on 3820 kc. Check in any or all of these active nets and meet the MDDC gang! June appointments: K3LFD as OBS and OPS, K3GJB as EC for Montgomery Co., Md. K3ANA again is active for the summer between school terms. BCD is busy as always with AREC affairs. Glad to hear from AKB/BWT, who are building a new radio shack on their house. K3BYJ is keeping Delaware alive on the MDD Traffic Net. CDQ is looking fit after her trip to the hospital. K3CXX likes FMT activity. K3CYA is rebuilding for DX this winter. The Antietam RA set up a 40-meter s.s.b. rig at Hagerstown Airport to handle Powder Puff Derby Air Race traffic. New reporter K3CXZ delivered one of the 9 FD messages received by your SCM. VE3DYK/W3 says traffic will be slow because of summer college. ECP says Washington RC's FD setup at Gambrills was struck by lightning with no damage other than a good scare! EEB has an antenna farm at his new QTH in Wilmington. EIS will be missed by the MDDC gang

while he spends two years in South America. 4EXM/3 checks in again from Okinawa. K3GKF would like to see a separate Delaware section. The PVRC held its June meeting at the QTH of VE3XW/4 in Arlington. WZL reports 61-62 officers of the Johns Hopkins ARC are K2KFF, pres.; K3GBT, vice-pres.; Geo. White secy.; K2PIM, treas. The club station, GQF, now has WAS, WAC, DXCC and 6 other certificates. K3GZK keeps the MDDs Slow-Speed Net going. HQE held a family field day in the Blue Ridge Mts. Congratulations to K3GJD, K3IRF and K3KHN, who received their BS in E.E. at Johns Hopkins in June! K3JZM reports good 50-Mc. openings early in June. JFR reports a big FD turnout in Kent Co., Del. K3JQ now has 7 countries on 80 meter c.w. The Free State ARC advises that 4PVR is the new pres. of the Foundation of Amateur Radio Clubs. K3JVB now has 5 watts going on 6 meters. K3-JYZ mele BPL again and is a real help to MDD and 3RN. KHA is going to ROTC summer camp. K3KHK needs only one more for DXCC. K3KPZ, along with K3MDL, K3NPEJ, K3NFXJ, K3NOGA and HYV, celebrated Amateur Radio Week in Baltimore with portable setups at three shopping centers. They also had programs on two Baltimore TV stations. KTR has retired from the Navy and is active again from Bethesda. K3-FJ keeps up his net activity. K3RJR has a "Sixer" and a halo in his VW sedan. K3LWD took his "Sixer" to Montreal but found no activity there. MCG is back from his trip to Key West and is getting the MDD Net organized for a big winter season. K3MZV has a new tower under construction. OHI is back on the air with his Ranger. K4TDN/3 reports he is ready with an outstanding emergency installation at his QTH north of Baltimore. TN keeps up his fine traffic activity. UE says 3RN has 100 per cent attendance. YZI has worked several new countries. ZAQ keeps up his OO activity. ZNW is helping with MDDs. Traffic: (June) K3JYZ 259, W3-TN 155, K3LFD 147, WBJ 129, W3UE 126, HQE 40, GQF 37, ZNW 32, ECP 29, K3GZK 23, MZY 15, W3JFR 16, K3JQ 13, MDI 12, W4G 12, KHK 10, BYJ 9, W3-MCG 9, K3ANA 8, LLR 6, W3BRE 5, K3GJB 5, K3NPEJ 5, W3Y2A 4, JZY 2, (May) W3EFZ 64, K3JQ 53, W3BUD 10, OHI 6.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY, RM: W2HJZ, W2HDW and W2ZL. A new appointee is K2QPN, Burlington, as OBS. W2ZI, Trenton, mobilized through several southern states and visited many friends. N.J. Phone & Tfc. Net June totals: 30 sessions, QNT 617 and traffic 143. W2-KWB and K2BG received Armed Forces Day certificates. W2SPV is a new call in the Haddonfield Area. K2CPR, CHC has received 122 awards. W2MEQ, Moorestown, also W2DES, K3KMO and K4DWU, expect to operate K54BC, Swan Island, during August. Field Day reports have been received from Gloucester County ARC, SJRA, Burlington County ARC, K2QIJ and K2AZJ. All reports reveal increased participation and higher scores. Again K2VNL's NJN Bulletin is loaded with fine information. Burlington Co. EC, K2ECY, reports four drills each on 2 and 6 meters and five on 10 meters during June. The AREC enrollment is 41. Gloucester County ARC members are now identified by luminous decals on their car bumpers. K2MPV, Chews Landing, is stationed at Andrews AFB. W2EXB and W2QDY, SJRA members, were tops in the recent WVE Contest. The Levittown (N.J.) Radio Club members recently enjoyed a late afternoon and evening picnic. W2HBE and K2KCI supplied a fine photo for SJRA's June issue of Harmonics. W2AEY has qualified for the WANJ certificate. WA2ONB, Haddonfield, has a new 6-over-6 antenna. K2ECY, Riverton, has returned from the Marshall Islands. Reports from areas not included in club reports are needed. All appointees are urged to report their activities promptly at the end of each month. A closer coordination between AREC and RACES is also needed in the section. Traffic: (June) W2RG 197, K2RNB 56, W2ZJ 54, W2ZI 35, W2KWB 26, K2SOX 18, K2ECY 14, W2HJD 13, K2CPR 10, W2MEQ 7, K2SNK 7, W2ARJ 2, (May) K2ECY 14.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2LXE, RM: W2RUF, W2EZB and W2EBB, RAM. W2PVL, NYS W, meets on 3415 kc. at 1900, ESS on 3590 kc. at 1800, NYSPTN on 3925 kc. at 1800, NYS C.D. on 3510.5 and 3993 kc. (s.s.b.) at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1000, IPN on 3980 kc. at 1600, 2RN at 2345 and 0230 GMT on 3690 kc. Please note that the 2245 GMT session of 2RN has been discontinued. W2EBB, mgr., has reported that he is

(Continued on page 80)

PROJECT HOPE W8OLJ/PK ON CBS TV SEPTEMBER 20

THE thousands of radio amateurs who have contacted the American hospital ship S.S. HOPE (and many thousands who have not) during its mercy mission to the Southwest Pacific island nation of Indonesia, may soon see this project in action in a Columbia Broadcasting System public service television presentation September 20, at 8:30 p.m. Eastern Daylight Time (Sept. 21, 0030 GMT).

THIS thrilling documentary story of a dedicated group of citizen volunteers on the S.S. HOPE undoubtedly records one of the greatest humanitarian projects of the 20th century. Amateur radio participation in and support of this project is in the finest tradition of our hobby.* Radio amateurs everywhere will share the pride of knowing that regular communication with home is provided by amateur radio over the 8,000 miles of Pacific Ocean separating the S.S. HOPE hospital staff and crew from the United States.

OVER 5,000 amateur radio contacts have been made since the S.S. HOPE sailed September 22, 1960. This included several emergencies and thousands of routine messages assisting this people-to-people project in carrying out its mission. One dramatic contact direct to United Nations Headquarters is shown briefly in the film documentary. The cooperation of radio amateurs throughout the world with the S.S. HOPE's amateur station over a period of many months is eloquent testimony to the ability of our hobby to make friends and inspire cooperation on a world-wide basis.

ARRL's Board of Directors and headquarters staff are to be commended for the unanimous endorsement of Project HOPE resulting in such good public relations for our hobby.

SPECIAL recognition is also due W6ZB, W6BYS, W6EJC, for their unstinting efforts over many months in handling S.S. HOPE traffic.

A 16 MM. film print, (color-sound) may be borrowed for showing to your radio club by writing "Project HOPE, Washington, D. C." and giving one or two alternate dates desired.

—RALPH C. CHARBENEAU, W8OLJ
(Guest Editor)

**Hallicrafters salutes the S.S. HOPE's completion of its
first year's mission! WELL DONE!**

* See "The Voyage of the S.S. Hope," April QST

Buell Halligan Jr.

W. J. Halligan W9AC

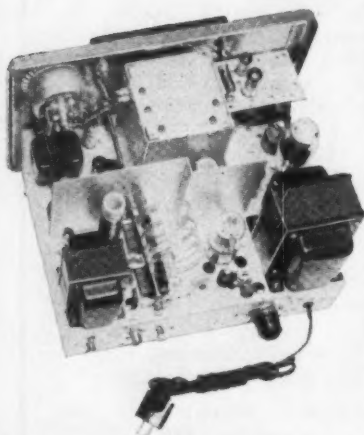
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As an exciter, the "Ranger II" will drive any of the popular kilowatt level tubes, provides a high quality speech driver system for high powered modulators. Control functions for the high powered stage may be handled right at the exciter—no modification required to shift from transmitter to exciter operation. Nine pin receptacle at the rear brings out TVI filtered control and audio leads for exciter operation. This receptacle also permits the "Ranger II" to be used as a filament and plate power source, and also as a modulator for auxiliary equipment such as the Viking "6N2" VHF transmitter. Unit is effectively TVI suppressed . . . extremely stable, temperature compensated built-in VFO gives you exceptional tuning accuracy and velvet smooth control. Complete with tubes, less crystals, key and microphone.

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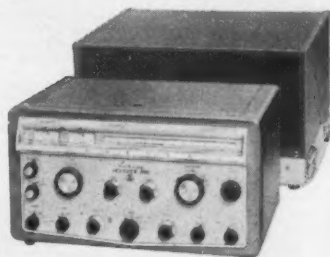
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Station Activities

(Continued from page 86)

looking for amateurs to take NCS and EAN liaison schedules. W2EZB made BPL. I am pleased to announce the appointment of W2FEB as RM and mgr. of NYS C.W. W2RUF has resigned as mgr. of NYS C.W. because of her health. We can never express our true thanks for the fine job Clara has done these many years. Through her efforts NYS C.W. has been one of the top nets in the country. We expect to see her on the bands because she will act as asst. mgr. to W2FEB, but after 12 years she's earned a rest. K2TDG has a new SX-101A. K2JXF is now mobile on 10 and 20 meters and has a NuVistor Front End on 6 meters. W2MPC won an AF-68 transceiver at the Rome Hamfest. W2VSP built an HB-14 and is now modifying to HB-16. He reports it's well worth the time and effort. K0QFB/2 is the new editor of RAGS Review. He replaces editor-publisher W2VSP. Judging from the Field Day messages received, this year saw a big turnout and a good time was had by all. The 1st Annual ARRL New York State Convention will be held in Niagara Falls at the Hotel Niagara, Sept. 13, 16 and 17. There will be something for all. Remember the State Power Authority has transformed the entire area into a huge park with new bridges, expressways, observation tower and, of course, the largest hydro-electric power plant in the world, which will be generating over one-half of its 2-million-plus kilowatts at convention time. It's a tourist's delight. For information write P. O. Box 682, Main P. O., Niagara Falls, N.Y., care of Convention Committee Niagara Radio Club. Appointments: W2VRKZ as OES; K2HOH as OPS. Endorsement: K2BBJ as OPS. Traffic: W2EZB 563, W2CIG 249, W2OE 248, W2HGB 204, W2FEB 139, K2MBU 138, K2QDT 87, W2COB 74, K2IMK 69, W2THE 64, W2PWX 59, K2TAN 50, W2AAN 48, W2NAN 41, W2PVL 12, K2EE 16, K2RYH 16, W2DAC 15, W2HEC 13, W2TTV 12, K2HUK 11, W2RQF 10, K2BBJ 9, K2HOH 9, W2ACRH 7, W2AKZQ 6, K2BWK 5, W2MCC 2, K2MGA 2, K2OGO 2, W2AKVN 1.

WESTERN PENNSYLVANIA—SCM. Anthony J. Mroczka, W3UHN—SEC: OMA, RMs: KUN, NUG and GEG. The WPA Traffic Net meets Mon. through Fri. at 0600 GMT on 2385 kc. The Keystone Slow Speed Net (KSSN) meets at 2330 GMT on 2585 kc. Mon. through Fri. Field Day is over and from the amount of messages received here, quite a few of the gang were out in full force. Yours truly and gang were up in Potter County. Anyone needing that county who worked UHN/3, drop us a card and we will QSL. TIF now has 48 states on 6 meters. K8OKT now has her General Class license. Congratulations to WRE on making BPL again. The Greater Pittsburgh V.H.F. Society's Hamorama was well received. Guests at the V.H.F. Forum were IFZJ, HOY, LOY, K2ATA, 4UCH and 3YA. The Etina RC reports via *Oscillator* that they are issuing a certificate for working members of the club. For further details, write to TOG. The Washington County ARC Net meets each Sun. on 3850 kc. and 145.35 Mc. at 1730 GMT. K3DXV now has his General Class license. From the *Tri-State Radio Newsletter*: K3JFB is going to college this fall; new officers of the Radio Assn. of Erie are K3GAO, pres.; KPJ, vice-pres.; K3KFF, secy.; K3ENE, treas.; KNQ, VNC, LKJ, NFM, WDK and YWL, directors. The *Huntingdon County ARC News* reports: WIV, MER, K3s AYW, HXV, HKS, BPF and CQU supplied communications for the Huntingdon County Dairy Festival; K3-OVY has his General Class license. The Juniata Valley ARC (K3DNA), through *The Static Blast*, reports: New club officers are KFW, pres.; K3AKN, vice-pres.; K3-GOH, secy.; PVZ, treas.; new Novices are K3APD, K3PLX and K3EPY; DUS has a new NC-270. From Coke Center RC: K3NFS now is in the Air Force; NCE is operating s.b. UGV was chairman of his local fireworks committee. Traffic: W3WRE 697, K3DKE 98, W3KUN 69, LSS 61, SMV 28, K3KMO 11, W3NUG 10, K3CLX 6, COT 4, W3GJY 4, K3AKR 1.

CENTRAL DIVISION

ILLINOIS—SCM. Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: PSP, RM: USR, PAM: RYU, EC of Cook County: HPG, Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CDT. The annual Field Day was an FB success, according to the reports coming in. Conditions in this section were much better and the scores reported have all been higher than the previous year. The Central Division Convention was well attended; the various forums and panels were very instructive and the gang went away with some fine technical knowledge. REC, ZIV, UA, IMN, KCR and K9CU participated in the recent Frequency Measuring Test conducted by the League. BKT is the call of the Experimental Amateur Radio Society of Rockford. New Novices heard were K9GQU, K9HSHQ, K9HXP, K9NLIJ, K9NFTM and K9FXG. KCR is recuperating from broken ribs and a fractured leg sustained in an

auto accident. JJN, LIN, MAK, K9QFR, K9UOV, QQG, K9RAS, K9QPJ, K9ISP and W9NIU were top scorers in this section in the April CD Party. EU has a new 200V on the air and reports that the DX is getting better. K9RAS wants to know if there is any multiplier for getting hit by lightning on Field Day. K9QMJ is sporting a new HA-1 To Keyer. K9UOV reports that he has antenna trouble because of the neighbors shooting it down. K9MLI is operating 6-meter mobile. PNY and K9TVA have received their WAS certificates. The Bloomington Club has signed up 14 Citizen Banders for the coming code and theory classes this fall. K9NCUB is working 15-meter DX on his new dipole antenna. USR reports that the ILN handled 185 messages in 17 sessions and K9KYW, net control for the North Central Phone Net, reports that the net's traffic count is 140 messages. K9-YOI and K9VQZ operated for 72 hours on 75 meters June 26, 27 and 28. K9HIV received an appointment to Navy O.C.S. and will leave for there Sept. 15. PVD is on 2 meters with a new 100-watt rig. K9HGV is seeking out new calls with his new Hi-Gain five-element beam. K9QPA was elected president of Gordon Tech. High School Radio Club. K9TSU, BOU, K9ZM and K9VJX are the new officers of the Perfect Copy Rag Chewers Net/Club of Chicago. QKE reports that this year's attendance was the largest of the Hamfesters' picnics, and wishes to thank every one who helped to make it a success. K9KXV is going mobile on 6 meters. ERU has 232 countries confirmed and is waiting for 25 more to come in. K9BUI is now mobile with a Johnson Viking. K9OKD received his Certificate Hunters Club Award. The traffic count for this month is very slow. Vacations and outdoor events must be taking the place of hamming with the recipients of the award for June traffic are: K9OZM and K9ISP, Traffic: K9OZM 815, W9USR 351, K9ISP 205, BTE 168, W9JXV 91, K9QAE 72, W9SXL 42, K9UOV 42, QYW 39, IVG 35, W9MAK 32, K9BIV 30, LXG 26, W9PRN 22, K9RAS 16, W9FAW 14, IMN 10, GLN 7, K9CRT 5, TV 4, K9N9BGV 1.

INDIANA—SCM. Clifford M. Singer, W8SWD—Asst. SCM: Arthur G. Evans, 9TQC. SEC: SNQ, PAMs: K9JAM, K9PFG and RYM, RMs: DGA, TT and VAY. Net schedules: IFN, 0900 daily and 1800 M-F on 3910 kc.; ISN (s.b.), 1930 daily on 3920 kc.; QIN (training), 1800 M-W-F on 3745 kc.; CAEN, daily at 1900 on 1805 kc.; QIN, daily at 1900 and RFN, 2000 Sun. on 3656 kc. New appointments: K9GLL as PAM of the Hoosier V.H.F. Net, which is being organized and expected to be in operation in Sept.; NM as OPS, DKR as EC for Howard County, K9OEA as EC of Benton County, NTR as EC for Perry County and K9GLL as EC for Lagrange and Noble Counties. An S.S.B. Pitch-In Picnic was held June 17 at Turkey Run State Park. On June 18 the 2nd Annual V.H.F. Roundup was held at the Jasper-Pulaski Game Preserve with approximately 100 in attendance. An organizational meeting for the new Hoosier V.H.F. Net (section) was held at this Roundup. To affiliate your v.h.f. net or to organize a v.h.f. traffic net, contact K9GLL for particulars. New officers of the Tri-State College ARC are 3HJR/9, 4CTU/9 and K2QVC/9. The club station, PMZ, made 11,668 points in the June V.H.F. Party and soon will have a kw. final on s.b. K9KXE is one of 30 students selected to attend a special summer institute at Ashbury College in Wilmore, Ky. The 8-week program is sponsored by the National Science Foundation and the subject is nuclear radiation. A new club is the Marshall County ARC which meets in Plymouth. Officers are JWI, BWU and K9ZLB. Indiana clubs turned out in full force for Field Day and publicity in the local newspapers was at an all-time high. *Amateur radio exists as a hobby because of the service it renders.* June net reports: IFN 288, QIN 201, RFN 41, ISN 216 and QIN (training) 31. Those making BPL were JOE, NZZ and K9RMI. Traffic: (June) W9JOZ 2216, ZYK 396, K9RMI 281, W9MM 261, NZZ 189, EPT 170, TIT 167, K9OET 112, W9SWD 92, VAY 3, K9CMG 80, K9TL 2, W9GJS 60, QYQ 58, RYM 53, HTK 46, K9WET 32, CRS 29, W9YXX 29, K9AOM 28, W9FWH 28, BDG 25, UGU 25, CC 21, K9DCX 19, ZKV 19, AVO 18, W9RTH 17, DOK 15, SNQ 15, K9ILK 13, W9BUQ 12, K9LZN 12, W9BDP 11, IMU 11, K9JAM 11, W9CLF 10, K9HIG 10, KTL 10, QWT 8, WJS 6, HMC 6, IXP 5, OFG 5, W9AB 4, YVS 4, K9QVR 3, UAN 3, K9VFOG 2, K9TL 2, (MGR) K9-AOM 38, CRS 29, W9YK 14, SFU 12, K9BSU 6, W9AB 4.

WISCONSIN—SCM. George Wolda, W9KQB—SEC: BCC, PAMs: NGT and NRP, RMs: VHP and VIK. K9ZCB is a new OBS. K9LIT, K9VSO and K9VJT received WIN certificates. Results of the May FMT show W9AIW/K6DDO made 3 checks on 3 bands with an average of 184 cycles off. K9KP made 4 checks on 2 bands with an average of 142.2 cycles off. VSO made 3 checks on 3 bands with an average of 223 cycles off. K9GDF made 2 checks on 2 bands with an average of 1216 cycles off. SQM, village marshall of Cochrane, now is on s.b.

(Continued on page 88)

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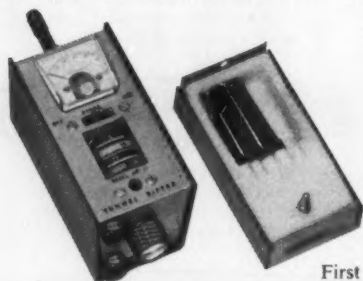
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An excellent transmitter for the novice or CW amateur who appreciates a clean, quality signal and real distance getting power! Features 50 watt RF power input on 80 through 10 meters, built-in low pass filter, single-knob bandswitching, switched antenna relay power and pi-network output coupling for complete operating convenience. A "tune-operate" switch allows off-the-air tuning and a large "clear view" meter indicates final grid or plate current. Easy access to crystal socket is provided by a metal pull-out cabinet plug. Power supply is built-in. Careful design and high-quality components used throughout make this kit easy to assemble and assures long, reliable and trouble-free performance for years to come. An outstanding "watts-per-dollar" value in amateur gear. 17 lbs.

Kit HX-11 . . . \$5 mo. **\$43.50**



- 50 watts input
- Single switch station control
- Built-in low pass filter



New!... nothing else like it anywhere...
the Heathkit "TUNNEL-DIPPER"...
exclusive tunnel-diode oscillator!

- Solid-state circuitry
- Completely portable
- Covers 160 to 1 1/4 meters

First of its type! Performs like a "grid-dip" meter but uses a tunnel-diode oscillator and transistors—no tubes! Built-in battery supply for complete portability . . . use it anywhere for alignment, trouble-shooting, etc. Features color-matched coils and dial scales for easy reading; printed circuit board for easy assembly. Protective cover has storage space for coils. Enclosed vernier-driven drum-type tuning dial prevents accidental change in settings. 3 lbs.

Kit HM-10 . . . \$5 mo. **\$34.95**

Improve your receiver performance
with this new Heathkit "Q" MULTIPLIER

May be used with any receiver having an IF frequency between 450 and 460 kc. This "electronic filter," with effective "Q" of approximately 4,000, provides either a sharply-peaked IF curve for CW, a broad peaked IF curve for AM or SSB, or a deep sharp notch for rejecting heterodynes on CW, AM and SSB. Both peak or notch positions are tuneable to any point in the receiver's IF bandpass. Ideal for CW reception and heterodyne rejection on receivers or transceivers employing fixed bandwidth mechanical filters such as the Collins 75S-1. Power supply is built-in. 2 lbs.

Kit HD-11 **\$14.95**



- Built-in power supply
- New styling

New low cost, broad coverage
Heathkit VFO HG-10

Covers 80 through 2 meters with each band separately calibrated on a rotating drum-type slide-rule dial. Uses a series tuned Clapp oscillator with regulated plate voltage for stability and a cathode-follower output stage for load isolation. Features 28:1 vernier gear drive, and "spotting" switch for off-the-air tuning. Powered by transmitter. Styled like the Heathkit DX-60 and plugs into it directly. Easy to build. 12 lbs.

Kit HG-10 . . . NO MONEY DOWN, \$5 mo. \$34.95



- Seven bands—80 through 2 meters!
- Rotating slide-rule tuning dial
- 28:1 vernier drive

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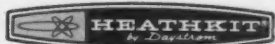
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CITY _____

ZONE _____

STATE _____

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a \$16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-T12TG)

OR IS K4ZRA THE NEW CHAMP? Read his letter, and see his diagram of a typical installation and what it achieved:

2539 Christie Place
Owensboro, Kentucky

GOTHAM
Miami Beach, Florida

Gentlemen:

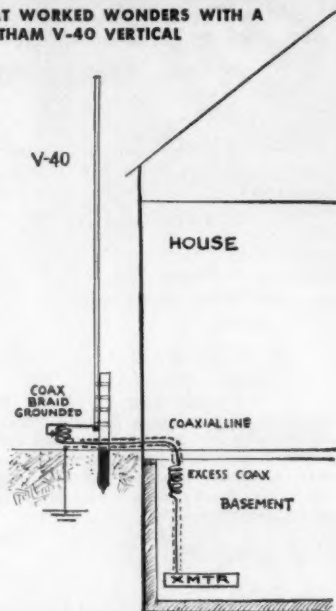
While I was at home last summer, I had occasion to use your GOTHAM vertical antenna on the air for about two months. I was quite amazed with the excellent performance of that inexpensive and simply installed antenna. It did everything you, K6INI, and others said it would, in spite of the generally poor band conditions during the summer months.

During the time I used this antenna, I worked well over 100 DX stations in 44 different countries, earned a WAS certificate, and worked the necessary stations for WAVE, receiving very fine signal reports from all. My rig ran from 75 to 100 watts plate input and the receiver was an old military ARR-7 (Hallicrafters rebored SX-28.)

The above mentioned contacts were made with the vertical mounted several inches off the ground, without radials, with only a simple ground connection to the coaxial shield. Later I raised the antenna up about 20 feet and installed the radials and this improved the already good signal pattern and enabled me to pick off another 12 DX countries and other DX contacts in a couple of weeks of good band conditions. In the latter part of August I used several single-band vertical and ground plane antennas and found that the single GOTHAM vertical equalled all these individual antennas.

Another attractive feature is the versatility of installation. It works high or low on ground, with or without radials,

K4ZRA's INSTALLATION THAT WORKED WONDERS WITH A GOTHAM V-40 VERTICAL



mounted in any space. Of course I did find that the best installations were the two mentioned above, but they were fairly simple to arrange, especially the first one!

The GOTHAM vertical is also a superior receiving antenna and I would strongly urge you to recommend that it be used for receiving as well as transmitting.

I just wanted to tell you how pleased I was with the overall performance of your antenna. For an inexpensive, easy-to-install, dependable antenna that really works for both DX and "local" W/K contacts, I don't see how one could ask for more and I would certainly recommend a GOTHAM V-40 to anyone desiring these features. Good luck in 1961 with those FB antennas!

Sincerely,

Daniel F. Onley, K4ZRA

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Send a card for our valuable catalog of 50 different antennas with specifications and characteristics. Gives bands and frequencies covered, element information, size of tubing used, boom length, shipping weight, feed line used, polarization, and other data.

FACTS ON THE GOTHAM

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- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Withstands 75 mph wind-storms.
- Non-corrosive aluminum used exclusively.
- Omnidirectional radiation.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price. **ONLY \$16.95.**

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Name

Address

City Zone State

Station Activities

(Continued from page 80)

with 1 kw. New officers of the Whitewater Club are LJO, pres.; OKH, vice-pres.; K9ACB, secy. K9YTJ was top scorer in Wisconsin in the Novice Roundup. K9HBT reports working 39 stations on 6 meters during June, with 45 watts and a four-element beam. K9YER has a new Valiant and an RCC certificate. OBS K9SQV now is operating RTTY. A new triband vertical is in use by 4VRD/9. MWQ reports increased activity on meters for emergency preparedness by the La Crosse Club. Six weeks was required by LFK to recover from third degree burns accidentally received from his 1040-volt supply. A traffic total of 13,860 was reported by Wisconsin operators for the first 6 months of 1961. Eight BPL certificates were issued. Appointments numbered 16 OPSs, 34 ORSs, 32 ECs, 12 OOs, 8 OESSs, 5 OBSSs. There were 33 known members of the A-1 Operator Club in the section and 1350 notices were sent by 9 OOs. There were 137 Official Bulletin transmissions by 4 OBSSs. DYQ celebrated his first anniversary as manager of the Central Area Net on June 1. Traffic: (June) K9YDYG 623, K9GQY 343, W9KQB 255, CYX 252, K9LIT 182, SAA 131, VHF 91, K9YTL 59, W9CBE 37, NRP 35, K9SQV 34, GSC 33, W9OTL 33, VIK 29, ONI 26, YT 24, MWQ 16, K9HDL 15, W4VRD 9, 15, K9CJL 8, ELT 8, JQA 8, W9ZB 8, NLJ 7, K9YDY 2. (May) K9VNO 81, JQA 18, W9FXA 16, MWQ 11, LJT 1. (Apr.) W4VRD/9 20, K9SQV 16, W9FXA 14, K9ZYU 10, WIG 4.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, W0HVA—PAM; K0KJR, RM: K7Z. Congratulations to CJC and his XYL on the birth of a daughter, North Dakota 75-Meter Phone Net report for June: 22 sessions, total of 415 check-ins maximum 25, minimum 10. Messages handled: 45 formal, 33 informal with 8 relays. North Dakota Post Office Net report for June: 4 sessions, total of 28 check-ins; maximum 13, minimum 5. Messages handled: 1 piece of formal traffic and 3 informals. GQD reports that GQD, AEG and K0YXJ, operating mobile off Garrison Lake on Field Day, worked 5 states. There are several new calls in Bismarck, among them K9OIKD. Traffic: (June) K0MPH 107, GGI 14, W0BHF 5. (May) K0MPH 144, ITP 54, GGI 17, TNI 17, W0AYJ 14, K0PVH 14, TVI 14, TTY 12, W0AQR 8, DNJ 8, K0KVB 6, W0BHF 5, CZL 5, K0TPK 4, W0GQD 3, K0WIO 3, W0BEH 2, K0GRM 2, W0HLM 2.

SOUTH DAKOTA—SCM, J. W. Sikorski, W0RRN—SEC: SCT, W5YZA, was awarded a S. Dak. C.W. Net Certificate. Russ is ex-W0DDL, CN8FZ, HZ2TG and KL7PL, and his present QTH is P. O. Box 5612, Midwest City, Okla. GCP has moved to 844 E. Cedar, Hillsboro, Ore. 1HDQ, of ARRL, visited the SFARC. RBN, SCT and several members of the SFARC visited the Radio Researchers Club, Brookings. The SFARC, operating two stations, made 729 contacts on FD. New calls: K9OJHO, Viborg, and K9OIBE, Centerville. I received less news than any month that I've been SCM. Hope it's temporary. Traffic: W0SCT 234, K0BMQ 119, W0DVB 66, YNR 9, K0TXW 5, W0FJZ 4, NNX 4, OFP 4, RVM 4, K0KOV 3, W0SEJ 3, ZBJ 3, ACG 2, AYJ 2, K0PDW 2, W0PTI 2, TVJ 2, YJF 2, K0KJS 1, QZV 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, W0KJZ—Asst. SCM: Charles M. Marsh, 0ALW. SEC: TUS, PAMs: OPX and K0EPT. RM: PET and K0IZD. The following club groups sent FD messages to the SCM: OREA/O, YAC/O, RA/O, K0EUN/O, K0VTE/O, MNXW/O, K0OSS/O, MASSR/O. Minn. Amateur Selective Service Radio Net, meets four times per week on 3838 kc. at 2200Z to handle traffic from the Selective Service Boards to Headquarters in St. Paul. K0VTG is going to Florida. He received his first Worked United Nations Award. Seventy-five hams attended the program in Vascon to hear 1HDQ speak on v.h.f. building and operating equipment. MJN-MSN members held their annual meeting at RQJ's QTH. Those present were K0s AKM, CIB, EUH, RSJ, UKU, VPP, SNC, SNG, VTG, IVQ, ORK, W0s BUO, CGK, DQL, ISJ, KJZ, KLG, RQJ, THY and PET. RM PET resigned because he is going into the appliance business for himself. The new RM for MSN is KLG. MSN will meet daily on 3595 kc. at 7 p.m. "Minnesota Time" the year around. In GMT it is 2400Z during the summer months and 0100Z the rest of the year. MJN is to meet one-half hour before MSN on the same frequency. In the annual EC survey at the end of '60, by percentage our section ranks 19th with 22 annual reports sent to Headquarters. Twenty-four ECs failed to send a report. In traffic our section placed sixth nationally. BUQ, LST and KLG participated in the recent FMT with very good results. K9OJDX lives in Reading, K0s AKM and UKU visited KJZ. RM PET delivered the MSN net report in person. New operators in Rochester are K9Os JEX, JFY,

JFV, JFJ, JRJ and JFH. RM IZD received his 3rd-class radiotelephone license. K0TXT states that he hopes to have his receiver in better condition soon and to be able to participate in nets again. SLD would like to see a 40-meter s.s.b.-a.m. phone net for Minnesota. Traffic: (June) W0ISJ 323, K0VTG 326, W0DQL 265, KJZ 262, K0VPP 186, W0LST 166, HEN 80, K0PML 59, W0OPX 32, BUO 49, K0YQC 43, W0ALW 42, K0ZKK 41, ISV 38, W0WMA 36, K0AKM 32, SBB 30, W0FPG 26, K0RDA 26, JYJ 24, UKU 24, IZD 23, QBI 21, W0UMX 21, K0VPJ 19, IDY 18, W0ATO 17, K0UB 17, KJX 14, SNG 11, W0WYU 9, K9OGPH 8, W0MXG 8, K0WYV 7, ZRD 7, K9OEUH 6, K0BAD 5, W0WWT 5, K0GFL 4, W0LIG 4, K0CIB 3, MGT 3, RHN 3, W0UCV 2. (May) W0ALW 46, K0YJY 13.

DELTA DIVISION

ARKANSAS—SCM, Daniel Patterson, W5SMN—SEC: K5CIR. PAM: DYL. RM: K5TYW. The OZK C.W. Net meets at 7 p.m. each week day on 3790 kc. Mainstays on OZK are SJJ and RIT. With the new weather equipment going in at Little Rock the Weather Bureau will be able to tract the storms over most of Arkansas. They have asked the hams to organize a weather net on 6 meters to confirm what they see on their radar screen. This is just another way that amateurs help to show the public and FCC that they are worth their salt. A very good source of equipment for the 6-meter net is the f.m. equipment which is being replaced because of split channel operation. It will have to be modified to transmit and receive on 6 meters but that isn't too hard to do, and can be made to operate on 6, 12 or 17 volt. This will be my last SCM report as I find that I cannot do the traveling that is more or less expected of the SCM. I have recommended that K5CIR be appointed to fill the vacancy until a new SCM can be elected. I know Odie will do a good job. I want to thank all the boys who have helped me in the past with the job of SCM. In the rush of the holiday I seemed to have misplaced the traffic reports, and I picked up on the air so I will just skip the traffic report for this month. Once again, thanks.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—Field Day messages were received addressed to the SCM from FKX/5, K5NTR/5, K5REN/5, UK/5, K5MDV/5, K5SGX/5 and W5XNL/5. The SCM and SEC visited several locations in the New Orleans Area during the Field Day period. When the Navy's Blue Angels came to Baton Rouge for the 4th Annual Baton Rouge Sky-O-Rama, several of the Baton Rouge boys helped the local officials with their mobile units in handling traffic, keeping the field and runways clear and other chores. A job well done received high praise from the local officials. Those participating were K5DAC, LJE, EOA, LRQ, OPL, RGI, USJ, USV and W5PKY. The week prior to the Field Day week end was declared amateur radio week in Shreveport by Mayor Fant. K5VHJ is busy handling traffic on the Gulf Coast SB Net. KRX has decided to come back and start handling some traffic again. K5CDC worked Field Day. Score: 214 points and a case of poison ivy. K5QXV had to borrow a receiver while his own was being repaired. UQR filed a lengthy report on 6 meters. K5RSO graduated from Amite High School as Valedictorian. K5LZA is back in La. from college station, Tex. Field Day activities got very good press reports and coverage. LDH had a nice spread in the Picanine Sunday Edition. SEC reports that emergency nets are standing by ready for the hurricane season. K5DGL, ESW, QCA and AYD reported contacts. FD, CEZ had two weeks vacation, fished, painted the house, cleaned up the junk room, wired the PE-95 generator, went back to work to rest. HHA has antenna trouble on RN5. Traffic: W5CEZ 281, MNX 130, K5AGJ 97, QXV 97, W5GKT 90, KRX 48, K5VHJ 48, UYL 21, CDC 14, W5EA 9, HHA 5, K5BXX 1.

MISSISSIPPI—SCM, C. Teetson, W5MUQ—Field Day activity was up in the section this year. Stations reporting were BW Biloxi, K5YGR Laurel, K5RUA Gulfport, FQ Meridian, K5BYB Clearmont Harbor, ROC Baldwin, KHB Natchez and PFC Jackson. 9CTJ is now stationed at Keesler. He is a v.h.f. enthusiast. K5LN has moved to Cleveland and is back on the air. K5GEI has been named state RACES Frequency Coordinator. TKK and others of the Jackson Club were active in the recent Powder Puff Derby. The Biloxi Club held its usual FB Hamfest in the Community Center and had a fine program. Congratulations, fellows. Director 4RRV was a visitor at the hamfest. New appointees are 9CTJ/5 as OES; K5QNE as EC. GTG has been transferred to New York City. We shall miss him in Mississippi. Traffic: K5RUO 119, AFP 27.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: K4OUK. RM: K4AKP. PAMs: W4PQP, W4VUP and

(Continued on page 98)



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HALLIKITS, we call them—a completely new concept of kit engineering that brings to your workshop, for the first time, these two outstanding advantages:

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HT-40 TRANSMITTER, \$89.95

A perfect match for the handsome SX-140, both in quality and appearance. Hallicrafters' transmitter leadership is evident in every precision-engineered feature of this crystal-controlled 75-watt beauty—features as important to old-timers as they are to novices.

- **FEATURES:** You get excellent CW performance as well as AM. Full band switching, 80 through 6 meters. Enjoy easy tune-up and crisp, clean styling that has efficient operation as well as appearance in mind. Unit is fully metered, TVI filtered.
- **SPECIFICATIONS:** Maximum D.C. power input: 75 watts. Power output in excess of 35 watts CW, 30 watts peak AM phone. (Slightly less on 6 meters.) Frequency bands: 80, 40, 20, 15, 10 and 6 meters.
- **TUBES AND FUNCTIONS:** 6DQ5 power output; 6CX8 crystal oscillator and driver; 12AX7 speech amplifier; 6DE7 modulator; silicon high voltage rectifiers.
- **FRONT PANEL:** Function (AC off, tune, standby, AM, CW); Band Selector (80, 40, 20, 15, 10, 6); Drive control; Plate tuning, plate loading, Crystal-V.F.O.; Grid Current; Meter; AC indicator light; RF output.
- **REAR CHASSIS:** Microphone gain; antenna co-ax connector; remote control terminals; AC power cord.



SX-140 RECEIVER, \$104.95

Doesn't it make sense to team up your skill with the experience of a company who has designed and built more high-performance receivers than any other in the world? Especially when the result is the *lowest-priced amateur band receiver available*?

- **FEATURES:** You get complete coverage of all amateur bands 80 through 6 meters, with extremely high sensitivity and sharp selectivity. Unit has RF stage; S-meter; antenna trimmer; and XTAL calibrator. Tuning ratio is 25 to 1.
- **CONTROLS:** Tuning; Antenna Trimmer; Cal. Reset; Function (AC off, standby, AM, CW-SSB); Band Selector; Cal. on/off; RF Gain; Auto. Noise Limiter on/off; Selectivity /BFO; Audio Gain; phone jack; S-meter Adj.
- **TUBES AND FUNCTIONS:** 6AZ8 tuned RF amplifier and crystal calibrator; 6U8 oscillator and mixer; 6BA6 1650 kc. IF amplifier and BFO; 6T8A 2nd detector, A.V.C., ANL and 1st audio; 6AW8A audio power amplifier and S-meter amplifier; (2) silicon high voltage rectifiers.

P.S. Both units are available fully wired, and tested. SX-140, \$124.95, HT-40, \$109.95.

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HOW TO USE GRID-DIP OSCILLATORS by Rufus P. Turner K6AI. The first book ever devoted entirely to grid-dip oscillators tells you how to construct and use this very versatile instrument with best possible results. It is applicable to all kinds of radio receivers and transmitters, also to television receivers. The grid-dip oscillator is a troubleshooting device—an adjusting device—a frequency measuring device—applicable to circuits and components in circuits—to antennas; also a signal source of variable frequency. #245, \$2.50.

SHORTWAVE PROPAGATION by Stanley Leinweil (Radio Frequency & Propagation Mgr.—Radio Free Europe). This review in QST (May 1960) sums up the book's vital interest to all amateurs:

"Of special interest to QST readers are chapters on amateur contributions to knowledge of wave propagation and a forecast—advanced with admitted caution!—of probable amateur-band conditions during the coming sunspot cycle. Throughout the book the reader is introduced to various interesting aspects of propagation: one-way skip, for example, scatter, meteors, auroral effects—all the things that hams continually encounter in everyday operation. It would be hard to find a question about propagation in the 3-30 Mc. region—at least the type of question that an amateur would ask—that isn't covered somewhere in this book..." #231, \$3.90.

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W4VQE. W4SKH was operated in the V.H.F. QSO Party from Mt. LeConte by W4LQE, W4VQE, W4RO, W4ZZ and W4SGI. FD reports were received from W4SKH, W4TM/4, W4EM/4, W4DIJ/4, W4RUL and W4AM/4. K4PKO wants skeds on 31.27 Mc. and reports new Generals in Murfreesboro are K4WJZ and K4YWA. W4PFP is on 75-10 meters with s.s.b. and a.m. and has installed a tri-band beam. K4AKP reports rig trouble the last week of June but check his traffic total. Net reports were filed by W4UVP, K4AKP and W4PQP; also an SEC report from K4OUK; OO reports from K4RIN, W4TDW and K4PCZ; OES reports from W4YRM and K4KYL. The new EC for Henderson County is K4TTA and K4FNR renewed his OES appointment. Traffic: (June) K4AKP 1008, W4PL 732, W4VJ 159, W4QFP 74, W4FX 60, W4ZG 50, K4QYV 44, W4PFP 42, W4UVP 26, W4JVM 14, W4UVL 12, K4PKO 11, W4TYV 11, W4ZJY 10, K4BWS 8, K4FNR 8, W4LLJ 8, W4UJO 7, W4VNU 3. (May) W4JVM 9, K4BWS 4.

GREAT LAKES DIVISION

GREAT LAKES DIVISION CONVENTION QSO PARTY

September 8-10

The Committee of the Great Lakes Division Convention will sponsor a QSO Party open to all amateurs residing in Kentucky, Michigan, and Ohio. The Party will be held from 2400 GMT Friday, September 8 until 2400 GMT Sunday, September 10. Any and all amateur bands may be used and any mode of emission. There are no power restrictions.

Scoring: Multiply the number of stations worked in the three state area by the number of counties contacted (291 counties are represented in the Great Lakes Division). Each station may be worked but once regardless of band or mode of emission used. Logs should include calls of stations worked, band used, signal reports, time, date, and county in which contact stations are located. Operation near the following frequencies is recommended: 3600, 3740, 3870, 7100, 7175, 7250, 14100, and 14250 kc. The call "CQ Great Lakes" should be used on phone and "CQ GL" on c.w. An engraved trophy will be presented to the highest scoring station in the contest. The high scorer in each state will receive complimentary registration and banquet tickets to the Convention. Certificates of performance will be issued to the three highest scoring stations in each state. Certificates also will be awarded to the highest scoring Novice station in each state.

All entries must be postmarked no later than Sept. 25, 1961, and should be sent to Contest Manager, Jack Siringir, W8AJW, 2972 Clague Road, North Olmstead, Ohio.

To encourage YL participation, the leading YL in the Division will be awarded an engraved trophy, registration and banquet ticket.

KENTUCKY—SCM. Robert A. Thomson, W4SUD. Asst. SCM: W. C. Alcock, W4CDA. SEC: W4BAZ. PAM: W4SZB. RM: K4KWQ. V.H.F. PAM: K4LOA. The Kentucky Novice Net, WN4AGH manager, had a traffic total of 67. Look for this net daily, 1800 EST, on 3720 kc. K4QCQ reports there are no NCS vacancies on KYN; however, get your name on the waiting list. W4KKG has the new 8-Line rig and "Christmas Tree" beams. K4PNW is using a DX-46 and an ABC-5 receiver on KNN. A new jr. operator for W4SLZ arrived June 20. Danny says he sure puts out a good signal. W4LXA, K4DWR and W4TVU are new members of MKPN. W4JSH/4 furnished emergency communications for Ravenna, Ky., June 10. Telephone service was out for over twelve hours. K4OLT and K4CSH had a perfect June attendance on MKPN. W4RHZ worked NSS and copied both c.w. and RTTY messages on Armed Forces Day. K4ZQR reports that 25 attended the ABC V.H.F. meeting (Louisville) June 21. The program included a tape on v.h.f. propagation. K4HSB is spending the summer in Detroit and Canada fishing. K4ZRA has 74 toward DXCC. OO reports were received from K4ZRA, W4SZL and K4ZQR. Traffic: K4VDN 142, K4QCQ 142, K4SH 70, K4VZY 62, WN4AGH 57, W4CDA 47, K4PNW 21, W4SUD 21, W4TYI 21, W4ZJY 21, K4ZQR 15, K4OLT 14, K4VDO 13, W4EJA 12, W4MWX 12, W4SZB 12, W4KKG 10, K4OZG 10, W4KJP 8, W4SZL 5, W4VJV 2, W4WVU 2.

(Continued on page 100)

DON'T DAMAGE YOUR CAR!!!! GET THE EXCLUSIVE **tii** MOBILE WINDOW BRACKET ANTENNA —CLAMPS ON OR OFF IN LESS THAN A MINUTE

- Anodized for beauty and wear
- Mounts in center of roof for best radiation pattern
- No holes or unsightly permanent installation
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- Rubber lined bracket clamps to window

All whips are interchangeable!
Use the same bracket for:
1 1/4 meter, 2 meter, 6 meter,
citizen's band, and the new
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(All bracket models complete with
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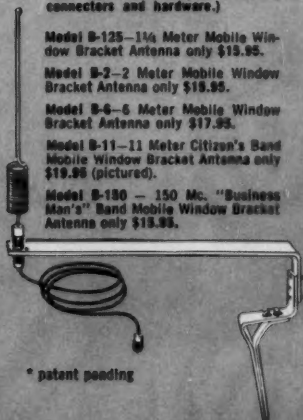
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dow Bracket Antenna only \$19.95.

Model B-2—2 Meter Mobile Window
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Model B-6—6 Meter Mobile Window
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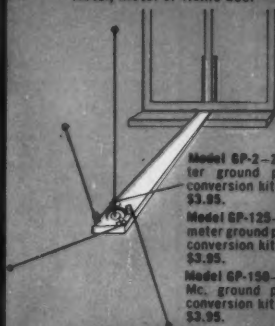
Model B-11—11 Meter Citizen's Band
Mobile Window Bracket Antenna only
\$19.95 (pictured).

Model B-150—150 Mc. "Business
Man's" Band Mobile Window Bracket
Antenna only \$19.95.



* patent pending

To convert your Mobile antenna for
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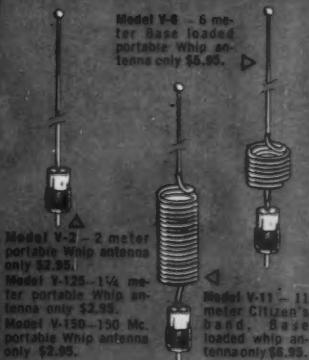


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★ Put your Tribander at 41' in 70 mph wind (125 mph cranked down to 24').

★ Tilts over for E - Z access to array.

★ Mounts Ham-M Rotor inside tower head. Top radial bushing and vertical thrust bearing.

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★ E.I.A. RS-222 specs. Heavy wall structural steel tube legs, solid steel rod diagonal and horizontal bracing—arc welded. ALL STEEL 55,000 PSI!

MODEL RBS-40P.

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MODEL RBS-40G. Hot dipped galvanized, Am Net \$209.50

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MODEL GPK-S40. Tilt-Over Ground Post. Am. Net. \$75.00

MODEL BAK-S40. Galvanized wall bracket and hinge base. Amateur Net \$10.50

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MICHIGAN—SCM, Ralph P. Thietren, W8FX—SEC: ELR, RMs: EGI, SCW, QOO and FWQ, PAMs: K8-CKD and JTK, V.H.F. PAMs: NOH and PT, Appointments: OIT and QOO as ECs; K8JMQ and JTK as OHSs; K8LZF and CCC as OPSs; NOH as OES; K8-LOS as OO. New officers of the Tri-County ARA are EWE, pres.; OKW, vice-pres.; K8RGA, treas.; K8-ETB, secy. We are sorry to report that K8NAW's XYL died and he is moving to the West Coast. The Wolverine S.S.B. Net has members in 7 states, and wants to be part of NTS. The Oak Park ARC has a hidden transmitter hunt each month. WFN now edits the Ford ARA paper. The GRARA reports that K8LR is now an ordained priest. The Muskegon Area ARC reports that K8BRJ is recovering nicely. The MCRC claims 740 FD contacts, 4440 points. The Genesee County RC had 80 operators and 75 AREC men out on FD. K8AEB still is after DX. VPC likes the "new" 75A-3. HK won a left-foot sending contest at a 800 shindig, but tried to keep it quiet. K8LUZ participated in his first CD Party. K8-HLR got good school marks and has a new RME-4330A. JTK is starting a Novice class in Jackson High School. ZHB goes back to the hospital for an operation on the other eye. K8JED has his TA-33 jr. working well. K8-LPV says, "You do get out better with an antenna tuner!" K8LOS is building an 813 rig. K8NRF, Ontonagon, took the Conditional Class exam. 30 Mc. was open most of June with all modes: c.w., RTTY, a.s., and a.m. OES reports were received from K8BGZ, EMD, FZ, NOH, K8NEY, K8PBA, PT and K8SPW. PT has 5 states on 432 Mc. Traffic: (June) K8LUZ 226, HLR 117, W8JTK 81, WQH 78, K8EXE 75, KMJ 74, W8FWQ 68, EX 51, ELW 46, K8GJD 42, W8NOH 42, K8OTJ 40, W8RTN 36, K8QVY 35, W8ZHB 24, CQY 21, K8GOU 20, W8BU 19, ALD 17, EOI 17, K8JED 16, W8AFL 16, MPD 15, HKT 15, DXJ 14, K8MEG 8, W8ALG 7, EGI 7, K8PYW 7, QLL 7, LPV 6, W8RVZ 6, K8LZE 4, NHC 3. (May) K8OTJ 62, W8QOO 49, RTN 33, K8NAW 21, W8WQH 21, K8CKD 14, W8THP 11, BEZ 9.

OHIO—SCM, Wilson E. Weekel, W8AL—Asst. SCM: J. C. Erickson, 8DAE, SEC: HNR, RMs: BZY, DAE, JTP and K8ONQ, PAM: K8MPY, K8RAY is a new Novice in Chesapeake. DWL and FWL are Silent Keys. The stork brought a baby girl to K8NVIQ and a baby boy to ex-K8BRO. LZE talked about ham radio to a Boy Scout troop. K8ONQ was elected secy. of the Cincinnati Section of the American Chemical Society. The Chix on Six's 1961 officers are WRH, pres.; K8VMY, vice-pres.; K8RGY secy.; and OIS, treas. Those in Ohio who work ten or those outside of Ohio who work four of its members will get a very nice certificate from K8PSE. Your SCM attended the Lancaster Hamfest, where approximately 2000 registered with about 700 amateurs and 87 took the General Class examinations with 42 passing the code. K8EOH won the NC-270. The Northeastern Ohio V.H.F. group held a Hamfest Picnic with 199 registering. Warren RC's Q-Match states that an amateur directory has been mailed to its members. The Canton ARC's Feedline has pictures of OJW and K8BXU, his son, on the cover. All club members received a club certificate. K8ZRS visited. W8JRSK also visited. KXP has a new TA-36. MND and K8ANA have new HQ-170s. YAB received El Paso WAE. OYV received K25 certificate. K8MZT received CHC. K8EML visited in California and K8TOX moved to Elyria. K8-MZT and AL received Worked Ohio Ladies Award. WOLA, K8ZQJ has a new Challenger. LJM is mobile on 6 and 75 meters. VJW and K8USJ have walkie-talkies on 6 meters. The Cuyahoga County AREC assisted the Antique Car Club in its show at Berea by handling information service to the public address system, parade control of over 100 antique cars and race control with AEU, OIS, RB, VFU, K8s COY, DRY, IBE, IHZ, JHZ, JSE, KTG, MME, NQA, OPV, OXZ, RAQ, SCL, SMQ and VMC taking part. The Greater Cincinnati ARA's The Mike and Key announces its big stag hamfest will be held Sun., Sept. 24 and at its meeting showed three movies. While you are in the hamfest mood the Findlay RC's W8FT News announces its hamfest for Sun., Sept. 10. Dayton ARA's R-F Carrier tells us its 1st meeting of June was a special v.h.f. night with K8SNJ giving tips on how to get more out of converters using Nuvisitors. K8HRD displayed his v.h.f. transistor gear, GVG exhibited his 1296-Mc. gear and told of steps in converting the ARX-6 along with talks by NAF, K8s BSM and GDV. QDI replaced TEK as c.d. Radio Officer. Massillon ARA's IARC states that OYL resigned as act. mgr. in favor of VYL and K8QJ has a new VHF Class Certificate. The OHKYIN V.H.F.'s Q-Fiver informs us that IXU spoke on Transmission Lines and Antennas. K8VZW's station was hit by lightning. VBG and K8GYK lost their 6- and 20-meter beams because of wind. Parma RC's P.R.C. Bulletin informs us the club is discussing incorporating and that K8s MTO and PDS joined the Air Force. Toledo's Ham Shark Group named K8HQF as its Ham of the Month. K8KFO and his XYL, mentioned in Virginia and TTM moved to Florida. K8s ZID, ZIV and ZJD are new Novices in the Tusco RC.

(Continued on page 102)

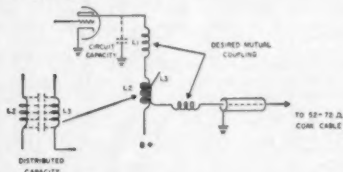
ONLY ONE KNOB TO TUNE THE 200V!

What's behind this knob? The Broadband Principle.

What is meant by a broadband transmitter? It is a transmitter with all stages designed to eliminate the need for manual tuning. Each stage has tuned circuits that are broadly resonant over a predetermined portion of the radio spectrum; for instance, 3.5 MC to 4.5 MC, 13.5 MC to 14.5 MC, etc. The signal is amplified in each broadband stage and is ultimately coupled from the plate of the final RF Amplifier to the antenna feed line through a broadband coupler.

WHAT'S IN A BROADBAND COUPLER? No copper sleeves, ferrites or any other "lossy" elements ... just wire!

There are no motors, servos or sensing circuits required to keep the 200V tuned up! The design of the broadband coupler does the job for you. It works like a transformer with a primary and secondary.



The primary L_1 L_2 is resonant at the high frequency end of the desired passband. Part of the secondary L_3 L_4 is wound bifilar with part of the primary. The bifilar winding has a distributed capacity between the wires. This capacity appears as a series resonant circuit with L_4 at the low frequency end of the desired passband. By controlling the size of the bifilar winding and the mutual coupling between L_1 and L_4 , it is possible to show the amplifier plate an essentially constant load impedance across the desired passband.

Write for 200V brochure for more detailed specifications.

EFFICIENCY? As long as the tube sees the proper plate load impedance, it will deliver power to that circuit. If this impedance is equal to that produced by a normally tuned and loaded circuit and the broadband coupler is not constructed with "lossy" elements, it follows that the RF power will be transferred to the load at essentially equal efficiency.

LOADING? Why do you normally tune and load an RF Amplifier? To make the tuned circuit show the proper load impedance to the plate of the tube at the desired frequency.

The output circuit of the 200V is designed to match 52 to 72 ohm coaxial transmission lines without dipping, loading, or tuning of any kind!

SWR? If the SWR is 2:1 or less, the reflected change in plate load impedance through the broadband coupler will be negligible.

HARMONICS? The broadband coupler could be designed wide enough to pass the 2nd Harmonic generated by the output tubes; however, since this is undesirable, the passband is restricted to one megacycle and a series trap circuit built-in to reduce 2nd and higher order Harmonics better than -50 db. The Harmonic rejection of the broadband coupler is equal to or better than a properly tuned Pi network.

The overall broadband circuit design makes possible a true single knob controlled transmitter. The *ONLY* tuning control is the VFO. In fact, the bands are so arranged that if you have the VFO set to 7280 KC and band switch to 20 meters, the transmitter is instantly ready to operate on 14280 KC; or switch it to 15 meters, and you are instantly on 21280 KC. The 200V is a Band Hopper's dream transmitter. It is the only transmitter that tunes like a receiver and yet provides the best sounding signal on the amateur bands!

73 Wes

Wes Schum, W9DYV

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**New EIMAC ZERO-BIAS TRIODE TUBE
and modern simplified circuit design.**

No screen or grid power supply needed. Operates with 2500 to 3000 volt plate supply. Use your existing plate power supply and have a new, compact, full kilowatt transmitter at a moderate price.

FEATURES

- 2000 watts PEP* input.
- Modern EIMAC 3-400 Z triode, 400 watt plate dissipation.
- Grounded grid circuit.
- Wide band input circuit—50 ohm all bands.
- 45 watts of drive for full input.
- Bandswitching, 80-40-20-15 and 10 meters.
- Height 7½", width 14½", depth 12½".
- Two-tone gray enamel "Eye-Appeal" styling.
- All controls on front panel.
- Metering: Grid current, plate current, plate volts, and relative power output.

*PEP input is approximately twice average d.c. input

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BZX, DAE, UPH and K3AAG made the BPL in June. Field Day, like Christmas, has come and gone and we hope all of you in Ohio had a wonderful FD and that you bettered your last year's score. Traffic: (June) W8-DAE 834, UPH 676, BZX 379, K3AAG 209, RYU 200, ONQ 153, W8ZYU 132, K8PFD 82, SQK 77, W8CXM 66, AL 60, LZE 46, K8MTI 43, W8PMJ 42, K8UQW 37, W8-STR 17, K8OEX 12, VKK 12, W8WE 12, AEB 10, QCU 10, LMB 8, K8RDX 4, HTM 3, EJI 2, EKG 2, W8WYS 2. (May) K8RYU 63, W8PMJ 17, K8BNL 14.

HUDSON DIVISION

EASTERN NEW YORK—SCM. George W. Tracy, W2EFU—SEC: W2KGC, RMs: W2PHX and K2QJL, PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc. at 1800; NYSPTEN on 3925 kc. at 1800; ESS on 3590 kc. at 1800; MHT (novice) on 3716 kc. Sat. at 1300. Endorsements: K2UTV as ORS and OBS; K2MBU as ORS. Congrats to K2UTV on making the BPL in June. Those Field Day stations reporting to the SCM included W2-HIP/2, K2AE/2, K2VC/2 and K2SPG/2. According to reports, band conditions held up well and large scores are expected. K2EIU received his E.E. degree at R.P.I. Commencement. Congrats. K2HNW, physics professor at Union College, spent the summer working on space technology in Los Angeles. Included among the college students heard during the summer vacation were K2-DEM, K2YZI, W2ALO and K2UTV, all fine traffic-handlers. After managing NYS for 11 years, W2RUF had to resign because of ill health. The net is now managed by W2FEB. E.N.Y. is solidly behind you, Keith. Among the newer traffic-handlers on the nets are W2PKY, W2-KUS, W2HGB, W2MID, K2TXP, K2VCJ and K2-SJN. With winter damage repaired, a new tower and rotator was erected by W2KUS. A new Mid-Hudson V.H.F. Society on 6 meters has been formed with K2-CVG, K2EXJ, W2ROE, W2ZBY, W2IEH, W2TNG, W2ADAP and W2MLH as charter members. Meetings are held Fri. at 0300Z on 50.38 Mc. We are looking for Emergency Coordinator candidates in Greene and Rensselaer Counties. How about it, fellows? Traffic: (June) K2UTV 1202, W2HGB 294, W2EFU 166, K2MBU/2 138, K2YZI 91, W2THE 64, W2PHX 59, W2PKY 51, W2-KUS 48, K2VCJ 30, W2MID 20, K2SJN 15, W2RUF 16, W2ALO 10, K2TXP 7, K2EIU 4, W2BXP 2. (May) K2MBU 166, W2THE 116.

NEW YORK CITY AND LONG ISLAND—SCM. Harry J. Dannels, W2TUK—SEC: W2ADO, RM: K2-UFT, PAM: W2UGF, V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 0900 GMT nightly and 0015 GMT on Sat.; NLI (late), 3630 kc. at 0300 GMT nightly; NYC-LIPN, 3908 kc. at 2230 GMT nightly; V.H.F. Traffic Net, 145.8 Mc. at 0130 GMT Tue.-Wed.-Thurs. Please remember that all reports should now be sent to W2OBU, the section's new SCM. At the time of this writing, George states that he plans a September meeting of all appointees. This will be the occasion to meet your new SCM if you haven't already had that pleasure. BPL cards go to K2UAT, W2EW and W2GZ, the latter two on originations plus deliveries. The section's traffic net managers are planning improved liaison between the h.f. and v.h.f. nets. If you operate on several of our traffic bands, how about a helping hand for liaison work? W2NKG is enjoying short skip work on 10 meters. K2STD, scenic for the Canal Zone and ex-Com-mack resident, revisited his old home and chatted with W2OBU, who used to be his neighbor. After many years off the air, W2VKS returned with a new G-76 mobile rig. K2MJO is working mobile aboard his boat, *The Clarabee*. Using a "Twoer," K2JTW mobilized to Connecticut for the Mohicans Annual Picnic, Nevada, Wyoming and Asia are the missing quantities for WAS and WAC at W2AGAF, W1OLY and his XYL, K1BWO, new residents of Dix Hills, are awaiting their new calls while operating portable with an Apache and an HQ-170C. W2ABQK reports a list of awards that would fill the column. Ken has worked 117 countries in four months and received his Extra Class ticket, too! W2SJC is using a new V-4-6 vertical and should soon be on with an HQ-110. New officers of the Stuyvesant HSRC, W2CLE, are W2BWO, pres.; W2PZG, vice-pres.; and W2VNSJ, secy. W2AGZ is a charter member of a new, re-formed Q5 Traffic and Ragchewing Net which meets Sat. at 1700 EDST on 3938 kc. FD conditions were fine despite set-up time showers. Judging by the number of FD messages received, the NYC-LI section was well represented. The gang from the Lake Success RC, W2YKQ, scored its highest FD total to date—1300 contacts in the five-transmitter class. W2CHC is active with an SX-101, an HT-37 and a TA-33 beam. The NLI Net now has a bulletin, the result of the efforts of RM KUFT, W2VZZZ contacts his brother, W2QHI, in New Jersey via 144 Mc. This is my next-to-last column. See you next month for the finale. Traffic: (June) K2UAT 1103, W2GPT 290, W2EW 269, W2GKZ 255, W2BWO 154, K2QBW 93, W2-QJU 45, K2CMJ 34, K2UYW 31, W2NKG 30, K2THY 25, W2PF 20, K2YQK 20, W2DBQ 18, W2OBU 11, W2TUK

(Continued on page 104)

IMAGINATIVE DESIGN CONCEPT

PRODUCES COMPACT,
LOW COST SSB, AM,
CW COMMUNICATIONS RECEIVER
WITH FINE RECEIVER PERFORMANCE



Now the leading manufacturer of quality amateur radio antennas offers you tried and proved components in the new Mosley CM-1 Communications Receiver. But — FOR THE FIRST TIME —

these have been combined so as to result in performance equal to or better than that of receivers selling for several times the price.

Ask for demonstration of the CM-1 at your favorite dealer. Prove to yourself that you need not spend more to get fine receiver performance!

Clean, functional panel layout and compact cabinet of receiver and speaker will complement the finest Amateur Station. Baked on dukane grey and black enamel over heavy gauge steel. Receiver: 10½" x 7½" x 8" deep. Speaker: 7½" x 7½" x 8" deep.

FEATURES and PERFORMANCE DATA:

- Double conversion with crystal controlled first oscillator.
- Diode detector for AM and product detector for SB and CW.
- Covers complete range of all amateur bands — 80 meters through 10 meters. Ten meter band segmented in three overlapping increments of 650 kc. each. Each band and each segment covers full 12" dial scale.
- Calibration every 5 kc. WWV reception at 15 mc.
- S-meter functions on AM, CW or SB, with or without BFO.
- Five dual-purpose tubes plus two semi-conductor diodes provide functions of 12 tube sections. TUBE and DIODE LINEUP: One 6AW8A, triode mixer and crystal oscillator; one 6AW8A, 2nd mixer and tunable oscillator; one 6AW8A, 1st IF and 1st Audio; one 6AW8A, 2nd IF and product detector; one 6AW8A, 2nd audio and BFO; 1N34, AM detector; 2F4, power rectifier.
- SELECTIVITY: 2.5 kc. at -6 db.
- SENSITIVITY: ½ microvolt for 10 db. signal-to-noise ratio on ten meters.
- STABILITY: Less than 500 cycles drift after one-minute warm-up. Less than 200 cycles change for 10% line voltage change. Temperature compensated and voltage regulated.
- IMAGE and IF REJECTION: 35 db. minimum.
- AUDIO OUTPUT: ½ watt at 6% distortion.

REAR CHASSIS ACCESSORY FACILITIES: Transmitter Relay Terminals, Accessory Power Socket, External Speaker/VOX Terminals.

POWER CONSUMPTION: 33 Watts. (117 volts AC, 50 to 60 cps.)

Net Price, only \$169.95

Matching Speaker, Model CMS-1. Net Price, \$16.95

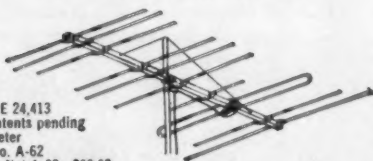
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Patent RE 24,413
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6 & 2 Meter
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Amateur Net A-62 \$33.00
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The Only Single Feed Line 6 & 2 METER COMBINATION YAGI ANTENNA

from **FINCO**

- Heavy Duty Square Aluminum Boom, 10 Ft. Long
- All Elements are Sleeve Reinforced And Completely Pre-assembled With "Snap-Out" Lock-Tite Brackets
- Boom Suspension Rods Are Supplied Completely Pre-assembled, Ready To Be Snapped Into Upper End Of Mast

ON 2 METERS:

- 18 Elements
- 1—Folded Dipole Plus Special Phasing Stub
- 1—3 Element Collinear Reflector
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ON 6 METERS:

- Full 4 Elements
- 1—Folded Dipole
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AG-6 6 Meter 4 Element
Amateur Net \$17.16
Stacking Kit AS-6 \$2.19



A2-10 2 Meter 10 Element
Amateur Net \$11.88
Stacking Kit AS-2 \$1.83

A11-10 1 1/4 Meter 10 Element
Amateur Net \$11.88
Stacking Kit AS-1 1/4 \$1.26

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9. WA2GAF 6, W2JBQ 7, WA2KWZ 6, K2PHF 6, K2MEM 1. (May) WA2GP 1 424, WA2F 18 22.

NORTHERN NEW JERSEY—SCM, J. Sparks Re-meet, K2MFF—SEC: WA2APV, RM: K2VNL, PAM: K2SLG, V.H.F. PAM: K2KVR. Sect.on nets: NJN daily at 2300 GMT on 3695 kc. NJPN Mon. through Sat. at 2200 GMT and Sun. at 1200 GMT on 3900 Kc. N.J. 6 & 2 at 0900 GMT Thurs. and Sun. on 31.3 M and at 0200 GMT Wed. and Sun. on 147.75 Mc. The above times are based on EDT. The NJN reports 30 sessions held, attendance 505 and traffic 395. The NJPN reports 30 sessions, attendance 617 and traffic 143. The N.J. 6 & 2 nets report 19 sessions, attendance 137 and traffic 33. The new officers of the ARS of Harrison are K2ANB, pres.; W2-NKD, vice-pres.; K2DQX, secy.; K2RIV, treas.; K2-SKK, gen. mgr.; WA2CZX and WA2AVT, directors. K2-1KZ is on 6 meters again after a three-year layoff and will be mobile in Ontario Sept. 9 to 19. K2CEP received the Michigan Week Award. K2LSX writes that he will operate from HL9KT while in Korea. Welcome to WA2-THG, who has moved to Elizabeth. Fred is ex-W7QLL from Reno, Nev. W2NIY received the Worked All Goose Award. The Mayor of Englewood proclaimed FD week as Amateur Radio Week in Englewood. WA2OVK and WA2RIB received their General Class tickets. W2REH's DXCC score is now 193/167. WA2CCF and WA2GQZ earned BPL cards for June traffic. The following stations had appointments endorsed this month: W2CVW as ORS, WA2EBR as ORS, K2EQP as ORS, WA2INB as OES, K2MGM as OO, W2NIY as OO and ORS. K2PVH bought a new Gonset IV, and is back on 2 meters. K2UKQ will be a district chairman for the YLRL in 1992. W2CFB is using a 20-meter ground plane on 80 meters, much to the consternation of NJN net controls, who usually don't hear him check in. *Late News:* Look for the following in the N.J. QSO Party: K2BML/2 from Cape May County, WA2CBB/2 from Hunterdon County and WA2COO/2 from Sussex County. WA2IHQ is operating from Maine while on vacation. Dan also received his 30-w.p.n. endorsement. The Raritan Bay RA held another 2-meter transmitter hunt. It took the winner, K2VVE, two hours to find the transmitter. The boys even used a gasoline generator to run the three rigs at the hidden site. W2-RXL is busy painting his house. Other endorsements are WA2EDG as ORS and K2SLG as OPS. Traffic: (June) WA2GQZ 695, K2UCY 235, K2VNL 216, WA2IHQ 213, WA2CCF 168, WA2COO 145, W2QNL 85, WA2EDG 77, K2VVL 76, WA2EQO 55, WA2KKH 47, K2PVH 47, K2-SLG 29, K2JTU 27, WA2GQI 25, K2MFF 23, K2MHP 20, W2RXL 16, K2CCF 14, K2MFX 13, W2CVW 9, W2GSA/2 9, WA2DE 8, W2CFB 8, K2EQP 7, K2AGJ 6, WA2IZN 6, K2UKQ 6, WA2APT 5, W2EYT/2 3, W2NIY 2, K2PQR 2, K2OQA/2 1. (May) W2CVW 20, K2ZFI 6, K2QGD 5.

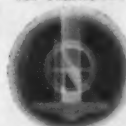
MIDWEST DIVISION

IOWA—SCM, Dennis Burke, W0NTB—SEC: K0-EXN—PAM: PZO. Correction: K0TOO is secy.-treas. of the Coon Valley Radio Club. K0UEB is EC for Johnson and Cedar Counties. Congratulations to the Hamilton County hams on the 100-Meter Picnic. III, EC for Story County, and PPP, pres. of the Ames Radio Club (now an ARRL affiliate) are presenting a splendid program on 2 and 6 meters. Our SEC, K0EXN, has 58 ECs in 90 counties toward his goal of 100 per cent coverage. W0-YSQ was appointed SNCS for Iowa in the Post Office Net. He wants to meet you PON members Sun. at 1400 CST on 3808 kc. The Post Office Department is three years along with its fine program. The Red Cross is re-organizing its ham service. The U.S. Bureau of Public Roads is eyeing the fraternity with a speculative eye, so please continue to give thought to public service. We received two fine reports from the Central Iowa V.H.F. and U.H.F. Club. K0HPQ is secy.-treas. UHO is on vacation in California. K0LUZ is on his way to the Navy. Hamfests are an every-Sunday occurrence in the Tall Corn State. CZ reports 18,766 traffic points in the past thirty-six months previously unreported. Not had for a boy. Traffic: (June) W0CZ 329, DUA 217, NTB 107, K0-IBD 47, W0LJW 38, YDV 21, K0POL 17, K3AQ 16, W0YSQ 16, WSV 13, K0BFL 10, W0FDM 10, PTL 9, K0IHC 8, W0YOZ 8, K0EVC 7, W0HNE 6, QVA 6, FMZ 4, QVA 4, K0VSV 4, WVK 3. (May) W0LHW 24, PTL 18.

KANSAS—SCM, Raymond E. Baker, W0FNS—SEC: K0IZM, RM: QGG, PAM: ONF, V.H.F./PAM: HAJ. Section nets: KPN, on 3920 kc. Mon., Wed., Fri. 1245Z, Sun. 1400Z, NCSs K0QKS, EFL, FHU, IFR, ORB; QKS, daily on 3610 kc. 0630Z, NCSs SAF, QGG, FNS; KSN, on 3925 kc. Mon. through Sat. 0601Z, NCSs the SEC and ECs. As of July 1 K0EFL will be our Phone Activities Manager. We wish to thank ONF for his help as PAM in the past months and hope all will assist K0EFL in making KPN one of the best of nets. Endorsements: QJU as EC Zone 4, BBO Zone 15, K0-JWS Zone 16, WFD as OPS, K0PIE as OO. The Following reported direct by message Field Day: Wichita
(Continued on page 108)

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(Teens) Amateur Radio Club Class B 12 operators, Atchison Radio Club 2 rigs 4 operators; Flint Hills Amateur Radio Club 12 operators; Kaw Blue Radio Club 2 stations 15 operators; BYC Burden 4 operators; Kansas Nebraska Radio Club 4 stations 16 operators; Wichita Amateur Radio Club 23 operators all AREC; Boothill Amateur Radio Club 8 operators 4 AREC; DEP/O Hutchinson 4 operators; Emporia Radio Club 3 rigs 8 operators; Smoky Valley Radio Club, Izenhauer Park, Abilene, 6 operators; Newton Amateur Radio Club 4 rigs 12 operators. All stations reported operating on emergency power. The new Kansas YL Net meets Tue. on 3940 kc. at 1600 GMT with KØHEU as NCS, Dot, KØGID, and Rolla, KØGIA, chaperoned the Teenagers on FD. Traffic: KØQQA 168, FNS 125, ORB 121, KØHGI 119, WØABJ 100, IFR 91, KØIZM 36, HVG 30, WØKKS 20, KØJID 16, EFL 13, GIG 12, QKS 12, ZQC 8, WØTOL 5, WFD 3, KØQOB 1, YGR 1.

MISSOURI—SCM, C. O. Gosch, WØBUL—Net reports: (June) MEN (3885 kc., 2400 GMT M-W-F) sessions 19 (reports for 9 only). QNI 232, QTC 22, NCSS, KØONK 4, KØMMR 4, OVV 2, OHC, KØVNB, KØWZN 1, HBN (7280 kc., 1805 GMT M-F) sessions 19, QNI 238, QTC 93; NCSS KØWNZ 6, ANT 3, KØYWT 3, KØJXD, QJU 2, KØLTJ, KØLTP, KØUHF 1, MSN (3715 kc., 2200 GMT M-F) sessions 22, QNI 124, QTC 138; NCSS KØFPC 9, KØONK 6, KØVPH 6, ORB 1, MN (3580 kc., 6100 GMT M-F) sessions 27, QNI 17, QTC 163; NCSS OUD 13, KIR 6, UXQ 6, RTW 2, KØQCC 1, SMN (3580 kc., 2200 GMT Su.) sessions 4, QNI 9, QTC 6; NCSS OUD. Please take note of the time change in MSN from 2230 GMT to 2200 GMT. Congratulations to KØFPC on receiving his General Class ticket. ANCSs for MEN are KØVPH, KØWNZ, KØKUD, Ø and BUL, KØKUD/Ø is on at Maryville with a borrowed Globe Champ while attending N.Y. Mo. The SCM wishes to acknowledge receipt (on the air) of the SCM messages from the following engaged in Field Day operations (all portable, of course, at location as indicated): KØPFF (House Springs), KØRNJ (nr. Kansas City), OXM (nr. Russellville), KØOKI (nr. Kansas City), KØYXZ (Appleton City), KØEY (nr. Jeff City), KØIGO (Pacific), KØAQØ (Warsaw), KØJCZ (Creve Coeur), KØHEB (nr. St. Joseph), KØYVT (Raymore), ENR (nr. Columbia), KØHKJ (Monett), KØITZ (Maryville), RR (Carney), KØAXU (DeSoto), QEV (Beaumont), EEE (nr. Rolla), RFU (O'Fallon), KØAZV (House Springs). Appointments: VVH as OO Class I and IV. Endorsements: KØONK as RM for MSN; OHC as EC. The SCM and OHC attended the MSN Picnic June 11. Traffic: Junt KØONK 9, WØMJK 169, KØVPH 165, WØUD 116, UXQ 113, KIR 110, KØPCK 67, WØBUL 63, RTW 48, KØFPC 43, WØOVV 28, WAP 24, KØWNZ 19, VNB 13, KØGFA 10, WØPXE 9, BVL 5, GBJ 2. (May) WØOMM 84.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—SEC: KØTSU, BNF and KØTSU are recovering at home in Kearney after an airplane accident. Denver Field Day activity reported; Bellevue KØUEH, Crete KØJOQ, Craig KØOFM, Norfolk VNI, Grand Island CUO, Chadron KØEMU, Omaha FFN, Hastings KØSOQ, Oak KØLFF, Beatrice YTZ, Broken Bow KØCEM, Falls City KØJKS. The Nebraska Emergency Phone Net, EGQ NC: QNI 720, QTC 40, informal traffic 76. The Nebraska 75-Meter Morning Phone Net, KØDGW NC: QNI 638, QTC 183. The Western Nebraska Net, WØNIK NC: QNI 616, QTC 63, 100 per cent reporting KØTUH, AHB, DVB, NIK, OCU, RIH. The 14th Annual Hamfest was held in Estes Park on June 17 and 18 with the usual Nebraska attendance. Traffic: (June) KØYDS 115, RRL 76, DGW 69, BRQ 38, WØOKO 26, KØUWK 26, WØEGQ 25, UOV 22, KØKRT 20, MSS 14, WEP 14, WØBOQ 13, NIK 18, VZJ 12, KØKJP 8, WØGPG 6, KLB 6, LFI 6, RJA 6, SWG 6, OCU 5, WØOXW/Ø 4, KØCBV 4, WØLIO 3, ZJF 3, HOP 2, PDJ 2, KØSCN 2, TIH 2, WØWKP 2, KØALY 1, WØRIH 1, KØVTD 1. (May) KØYDS 25. (Apr.) KØYDS 22.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Henry B. Sprague, jr., WICHK—SEC: EOR, RM: KYQ, H.F. PAM: YBH, V.H.F. PAM: FHP. See last month for traffic skeds. LIG, VW and KHTV made an excellent showing in the May FMT. APA is traveling 8 states on business but manages to work 40-meter a.s.b., enough to contact KCAUSV, HZLAB, EA7GP and KHØBB. BDI QØSØs others to make 1177 (unofficial) Field Day QØSØs over TX/1 at Norfolk with the CWA. He also made the Augusta, Me., Hamfest. FVV sold his 144-Mc. gear and now is on 50 Mc. exclusively. KNIPKQ got in the V.H.F. Party. RAN went on FD with W420JD (ex-WIODW) and K3GUR atop Overlook Mt. They made 450 c.w. contacts and 207 on phone with 8 operators. KIKSH is moving and wants to thank the Hamden Radio Club, KIAMO, for its help with the equipment for the West Haven Vets Hospital, of which he is a trustee. (Continued on page 108)

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Loading inductor is wound directly on upper portion of strong, lightweight fiberglass support column. Exact resonance anywhere within any band is obtained by simple, plunger-type adjustment of stainless steel top whip. **Winding is contacted internally**, is encapsulated in durable epoxy for lasting exterior protection. No exposed joints to corrode, no flimsy plastics involved. **Strong! Durable! Unaffected by moisture.**

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FHP reports that the CQRC made nearly 700 Field Day contacts in the 5-transmitter class with no breakdowns and K1BSB and K1CWF serving as cooks. CYN had 12 sessions, handling 9 message with 37 stations in attendance. High QNI were FHP, K1PUG and K1NPQ. KYQ reports the CN had 30 double sessions and handled 312 messages. With 238 on the first session, the average was 8.6; 34 handled on the second gave an average of 1.8. Attendance averages were 8.3 on the first and 2.9 on the second. High QNI: RZG and K1s MZM and IFJ. The Southington ARC operated ECV on FD with 12 operators. YBH says CPN had 29 sessions and handled 78 messages averaging 6 per session. Attendance averaged 25. Honor roll for attendance: FHP, K1PFF, LWW, VQH, DAV, K1DGG and K1AQE, HKT and YBH, UWY, a YL is on 6 meters with a Heath "Lunchbox." K1KSD's house was struck by lightning, which ruined a lot of expensive equipment that he was in the process of rebuilding. K1LOM is going in for traffic. His dad is KN1NYT. The Tri-City ARC held its annual meeting electing IOH, pres.; K1KX, vice-pres.; DCM, secy.; WAZ, treas.; K1HOY, corr. secy.; FML, act. mgr.; and LBV, LCJ and K1GOX, stewards. NR now has a DX-100 going and is a member of the QCWA. LIG, K1s GGG and K1MJ went mobile on FD, visiting both the Hamden RC and Milford RC setups. Reports received: QES from FHP and K1MNX; OD from ECV, K1NPQ and K1s IVR and GUD. NTH was appointed OPS and K1JBN's appointment as EC was renewed. Traffic: (June) W1KYQ 245, AW 133, YBH 129, OBR 102, NTH 84, NJM 82, K1PFF 62, DGG 33, JVZ 27, AQE 24, MBA 22, W1BDI 19, CUH 18, CHR 17, K1PUG 5, WIAPA 4, BNB 4, QV 4, CTI 1, K1PQG 1, (May) W1NJM 142, K1MBA 26, K1DGG 23, W1RFJ 15.

MAINE—Acting SCM, Herbert S. Merrill, K1JDA—The PTN meets daily at 1900 on 3596 kc. The SGN meets daily at 1700 on 3940 kc. The MSSN meets daily at 1730 on 3726 kc. Sun., Sept. 10, is the date for the Rockland Hamfest. Be at the Rockland Legion Hall any time after 9:30 for a setup table, a mobile hunt, a turkey dinner and prizes. It's \$3.00 at the door or \$2.50 if you send reservations to K1NYY, Dick Glidden, Waldoborough, Maine. K1GUC has acquired a Viking I and K1JNN now owns a DX-100. K1KSG is building an 813 rig and is competing with his brother, K1MBM, for DX. Each has worked 79 countries. K1MBZ has added screen modulation to his 813 rig. K1NSGU is a new Novice in Old Orchard. K1ROD has graduated from the Novice class and is on the air with an HT-9. VXV is moving to Augusta. At this writing we don't know who the new SCM will be, but the new man will be hard at work by the time this issue is printed. My congratulations to either BCB or EPN. If your new SCM gets anywhere near the help and cooperation I have had, the Maine section can do an outstanding job in living up to the Amateur Creed. My work as interim SCM has been a wonderful experience and has deepened my convictions that the amateurs are a wonderfully dedicated group. My thanks to all. See you on the air. Traffic: K1MBZ 64, KSG 53, IMI 30, W1ISO 28, K1MBM 14, DYG 4, W1GPY 4.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, Jr. W1ALP—SEC: AOG, DDD and K1QJT are new OESs. We regret to announce the death of AAH. I received many Field Day messages from clubs and groups in this section. How many Novices read this column? I still get inquiries about a slow-speed net. Anyone interested in taking this over? The following took part in the May FMT: BGW, BB, OGU, K1LJK, K1GUU, DDO and TZ. Heard on 2 meters: NQQ, K1OOR, K1NSCJ, K1LWJ, K1NROG and K1NPRM. WQH writes from England and hopes to be home in Lexington in October after 4 years over there. NF went to N.Y.C. K1SBH is on 6 meters. K1KUY reports that the Marblehead Jr. Civil Defense operated on July 3, the night of Harbour illumination in that town. YHY is home after a 3-month tour of duty in the Navy. EX-K1ODI, is now K3BYJ. K1NSOP has a Globe Scout 680 and an AR-3 receiver. He and K1NISN are after WA. K1MOQ-W1WIK, in Newton, is on with K1WM-2, kw, linear, Elmac AF-67 and S-76. DEL is going on a 3-week cruise with the Navy. IAU has a new QTH in Whitman. K1MVN, at club station K1OOR, is working out on 6 meters very well. LMZ, RGM, AHE, FRR, K1COB and K1KTH have been working at ZBT's, who has a 2-meter 64-element beam up 160 feet, also a five-element for 6 meters. K1QXB, Tewksbury, is on several bands. ECO/1 was on FD in Candia, N.H. The Mito club held its last meeting until fall. EZV is traveling through New England as a sales engineer. K2LYG/1 is in Boston. The QRA had its Annual Bean Supper and a talk and slides by LEL and his XYL on their trip to Europe. K1QJT has a Gonset, a Ranger and a 6N2 and visited ONS 40M, VL and VN in Brussels, also 3A2BF. ACU has a new Falcon car. K1MEM has an HRO-50R1 and has earned CHC. K1KTK was in the hospital. K1BYV has a model EE-3 electronic keyer. K1DIO is getting out on 6 meters. RCJ is building a kw. linear for his s.s.b. exciter. PTR

(Continued on page 110)

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keeps a sked with his dad, 9YPP, each week. ELP worked Wyoming on 6 meters for his 48th state and has more than 2400 QSOs. QFO is back on 2 meters. OFK is busy in his new QTH. KIEKO and GUU have a new crank-up tower and beam. They and ZEN went to the Augusta Hamfest. Our 2-meter net had 22 sessions, 288 stations, traffic 144. KIKKS is active on 6 meters and is doing some building. HIL is doing a lot of traveling all over the country. KIMMC is mobile on 10 meters. KILUI has a DX-40 on c.w. The North Eastern States Traffic Net had 173 stations, 127 traffic. WEJ reports that there is a code class at 10 P.M. on 6 meters on 50.65 Mc. KIDSA/WISWX has moved back to Maine. KIAFF visited his son up in Argentina, Newfoundland. DFS, manager of the North East States Traffic Net, says the net is changing its frequency to 3893 kc. on 10 meters. 5:30 P.M. Traffic: (June) WIEMG 220, KIBYV 212, WIDFS 86, OFK 59, DOM 41, ZSS 35, KIKTK 34, WIPX 34, AOG 25, KIHUS 25, DIO 22, MEM 22, WISIV 22, KIGKA 8, WIRCQ 4, KIGTX 3, LJK 3. (May) KIGNR 154, MEM 41, WIAUQ 3.

WESTERN MASSACHUSETTS—SCM. Percy C. Noble, WIBVR—SEC: BYH, KIAPI, RM: KILJV, PAM: DNS. DPV spent a two-week vacation in W-Land. KIGCV is operating portable in Vermont this summer. We understand that UKR is paying a return visit to OHSSM in Finland. FB! RM KILJV reports the following for the West. Mass. C.W. Net (WMN): Number of sessions 20, traffic handled 133, average QN per session 4.3. WMN again had 100 per cent attendance. IRN during June. KICAU is now one of our most active stations on WMN. KILBB, manager of WMSN, got out an excellent bulletin for the members of his net. The West. Mass. c.w. gang held a picnic at Quabbin Reservoir on June 18 which was well attended and apparently enjoyed by all. Not much phone news this month, you say? Right, but I can't very well send in what I don't get! You send me the dope and I'll see that it gets in print. OK? Traffic: (June) WIBVR 166, KILJV 156, WLDE 143, KICAU 133, WIZPB 125, KILBB 46, WIDVW 15, FAB 14, KIGCV 5. (May) WYK 132.

NEW HAMPSHIRE—SCM. Ellis F. Miller, WHIQ—SEC: KIGQK, PAM: KVG. GSPN meets Mon. through Fri. at 2300 and Sun. at 1330 on 3842 kc.; CNEN meets Mon. through Sat. at 1045 on 3842 kc.; NHN (c.w.) meets Mon. through Sat. at 2330 on 3685 kc. Endorsements: KIGQK as OO, KICIF, our RM, has resigned, having moved to Camden, N.J. Good luck, Dave. Watch for announcement on a new RM appointment. The GSPN Picnic was held at KVG's on June 10 with over forty members and families in attendance. A wonderful time followed by a penny auction was enjoyed by all. The Annual ARRL Field Day has come and gone with FB WX to make it a success. Club stations HVG, KIBKE and KIOUR report multiband operation with fine scores. Other groups reporting also were pleased with results. The mountainous areas of this section were well populated with v.h.f. participants. 2- and 6-meter activities being heavily emphasized. It was heartening to note the goodly number of AREC members participating. Indications are for an even greater activity next year. Traffic: WIOGU 63, PFU 22, HQ 14, YHI 3, BYS 2, EVN 2, KIMID 1.

RHODE ISLAND—SCM. John E. Johnson, KIAAV—SEC: PAZ, RM: SMU, PAM: TXL. OBS reports were received from WED, SMU and TXL. OES reports were received from KIDZX and KAZ. RISP reports 30 sessions, 279 stations, 43 traffic. Field Day reports were received from the following clubs: JT/1 at Buck Hill with 25 members, SYE/1 at Newport with 20 members, VXL/1 at Cranston with 10 members, AQ/1 at Lincoln with 15 members, KKE/1 at Johnston with 16 members and DDD/1 with 21 members. The Barrington H. S. Club held a buffet supper at the home of their advisor, VEM, prior to graduation. As its final activity for the year the club participated in Field Day. Members taking part were KIBWD, LNL, MXO, NEF, NYK, KIQEL, RDD and RNX. The WIAQ Club reports it has added an NC-300 to its station and has issued WRI certificate No. 10 to BGA. The NCRC of Newport worked with C.D. Director PAZ to provide communications at the recent Jazz Festival. The club held a successful FD, making 620 contacts in 44 states and 3 foreign countries. KIPEL has received his Technician Class ticket and PAM reports he is home from school in New Hampshire and will be active on 6 meters this summer. Traffic: (June) WISMU 601, TXL 143, KIBBK 37, DZX 31, GRC 13, AAV 12, LSA 5, GRA 4, WIWED 5, KIPZY 3, PAM 1. (May) WITXL 251.

VERMONT—SCM. Miss Harriet Proctor, WIEIB—SEC: KIDQB, PAM: HRG, RM: KRV. KJG, cruising down the lake, tied up at Vergennes and visited the shack of HFS. Any other Vermonters operating mobile on our lakes? FD activities were reported by the Wind Hams Club in Bellow Falls, the Central Vt. ARC in
(Continued on page 112)

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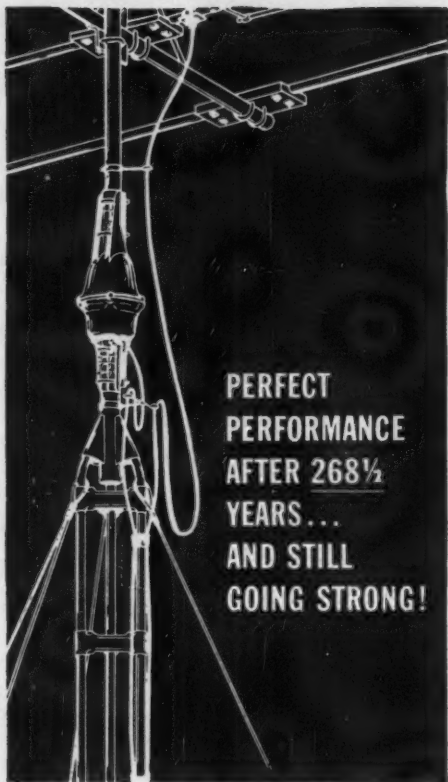
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Montpelier and the Middlebury Mike & Key Club. We wish several Vermonters would give special attention to 20, 15 and 10 meters (when that band is open) for QSOs with amateurs wishing a Vermont contact. A special certificate awaits the one who gives us a report on being the first Vermont contact for twenty-five non-Vermonters. Please furnish your SCM with a 35-m. colored slide of you and your station so we can make up a set for loan to individuals and clubs.

NORTHWESTERN DIVISION

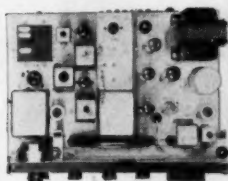
IDAHO—SCM, Mrs. Helen M. Maillet, KW7GGV—Many groups and clubs participated in Field Day activities but only two, SWS/7 and K7OJI/7, got messages to the SCM to gain an extra 25 points. Certificates for high scores in the V.H.F. Sweepstakes were received by K7GQE and GGV. U.A. K7CXP and GGV were enrolled in the Wouff Hong at the Rocky Mountain Division ARRL Convention. The Magic Valley Club displayed a complete ham station at the public library during National Radio Month. IHDQ, of ARRL, visited the Magic Valley Club and displayed his 2- and 6-meter gear currently appearing in QST. Commended for a communications job well done during the Women's Air Derby were K7LLA, base station, assisted by KXJ, UNI, TPC, JHY, GDA, NGA, K7S CQ, DMZ and HDW. Jim, formerly AOT, applied for and got a 2-letter call, U.A. He has been licensed since 1921 and made a consultant on a.s.b. from Pocatello. K7GHE joined the Coast Guard and is QRT. FARM Net traffic: 77, check-ins 331. Traffic: K7KBY 80, W7GGV 28, K7HLR 22, W7VQC 16.

MONTANA—SCM, Ray Woods, W7SFK—SEC: BOZ, FAM: YHS, RM: K7AEZ. The MPN meets Mon.-Wed.-Fri. at 1800 hours on 3910 kc. TSN has been discussing for the summer. MSN meets Tue.-Thurs.-Sat. at 1830 hours on 3530 kc. Ex-SWE was visiting at Harlowton from W3-Land. NYK is heard working portable at Helena. Your SCM and his XYL, TGG, attended the Havre Picnic. TVY may be heard from his new QTH in Florida. K7MIL is a new call in Livingston. K7CZQ and her OM are visiting in Wisconsin. QY and DXM are teachers at summer school in Havre. PYN/4 is visiting his parents, QAK and QCP, before leaving for Germany. Ex-BUJ made it out for Field Day from St. Paul. K6-BUR, formerly W7YXQ, visited his Brady friends. EEO and family visited W3-Land. Butte and all Montana amateurs who knew LNS are sorry to hear of his passing. YTG, of Harlo, is on top of Kings Hill portable with the forest service. TGM and TGL vacationed in Spokane. RSK and RSI are residing in Sidney now. K7-MYQ and MYO, of Sidney, passed the Conditional Class exam. Sidney also is with a radio club. K7OFG has gone western with pistols and guns. Traffic: W7SFK 14, NPV 11, K7OFG 8.

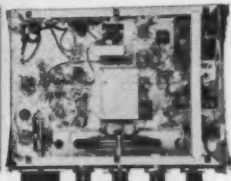
OREGON—SCM, Everett H. France, W7AJN—Appointments: K7KTP as OO Class III-IV, GUH as OO Class I-II along with his present III-IV. Congratulations to the Bay Area Radio Klub and the Beaverton Mike and Key Club on being affiliated with ARRL. More congratulations to the SEC and ECs on their fine work, as ARRL reports that the Oregon section now ranks 7th for 1960 and the records show Oregon to be 11th for 1959. In reply to some possible queries regarding activities of the Southern Oregon Radio Club of Grants Pass during the Memorial Day Boat Races, which covered a distance of 25 miles of the river, mobile, portable, home station and airplane were used. OES K7DVK's major activity is experimenting. LW is converting a surplus receiver for 2 meters. K7BZP is working on an Apache transmitter. KEN has joined the "Rock Hound Fraternity" and has some nice specimens polished up. Good Field Day reports were received from on-the-air stations TMI, OTX, DTT, QXS, K7OUS, K7VJT, K7CCH and K7OBU. OSN BRAT awards went to AJN, MTW, ZFH and K7IWD. K7ERY is visiting in Vera Cruz, Mexico. NGW, HIO, CIL, and K7AIS and K7OJS operated 2- and 75-meter equipment for the Hydroplane Races event during Portland's Rose Festival. K7AXF, Coos County EC, is busy recruiting AREC members. K7IWD is chasing 40-meter DX. DDT reports the K-W Club in Washington County has received the call K7PXY. ESJ is busy forming a low-power 80-meter c.w. relay chain with BVH, USO, ESS, SMR, AAI, DIE, MUS, K7IWD, K7AJB, K7NTS and K7CVX. They are NARS members. Traffic: (June) W7BDU 192, K7AXF 186, W7MTW 45, ZFH 45, K7IWD 41, K7BK 30, W7DTT 28, AJN 14, DEM 13, K7CNZ 12, W7NGW 8. (May) W7GCU 19, K7CNZ 11.

WASHINGTON—SCM, Robert B. Thurston, W7PGY Reports received from individuals and clubs throughout the state during Field Day indicate a large turnout for participation in the section. New officers of the West Seattle Amateur Radio Club are BQG, pres.; EWP, vice-pres.; IBR, secy-treas. An intensive drive is now in process for new members from the south and west side of the city. The section finally has reached its goal for

(Continued on page 114)



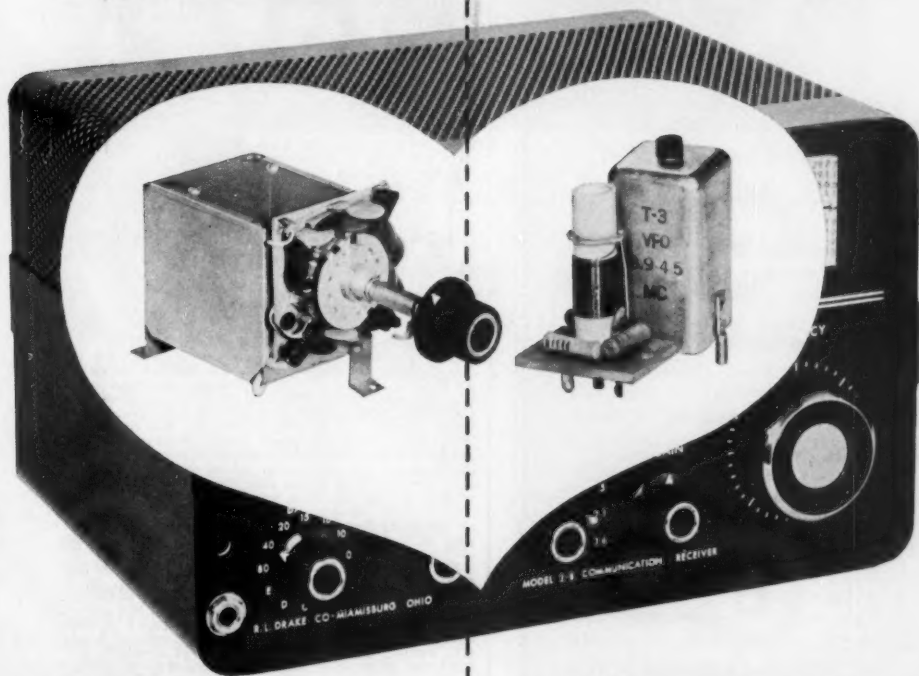
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With the Model 2-B you have all the advantages of a "Ham Band Only" receiver. Superior SSB, AM, and CW in seven band switch positions . . . plus . . . five extra positions on the bandswitch for interchangeable plug-in crystals to permit reception of any 600 kc bands in the 3.5 to 30 mc range. Amateur Net, \$279.95

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an EC in each of the 39 counties with the appointment of LLV as EC for San Juan County. The AREC Forum is QRT until September. HMQ and WHV plan an AREC state tour for the summer months. JTR and Stevens County were active for 48 hours during OPAL 61. MCU is using a new 200-V sidebander. The 15th Annual Walla Walla Picnic will be held Sun., Sept. 17 at Wildwood Park in Walla Walla. Try to attend if possible. K7CHH is planning an n.f.m. modulator for the Ranger. K7IEY received his ORS appointment, and the following renewed as ORS: AMC, APS, OEB and PGY. K7NHG is active on 20 and 40 meters from San Juan County and is looking for contacts. K7NOBY passed the General Class exam. CWN is just about ready to install the new tri-bander he won at the Bremerton Hamfest. VPW is QRL landscaping his QTH. K7CTP is doing a good job NCSing on NSN. REC is operating a boat mobile from Alaska on 75 meters. AMC went on vacation to Yellowstone and will attend the International Hamfest at Watterton State Park. DC and MRG joined the ranks of Silent Keys. AIB reports that the many different chores around the house cuts down on hamming. ACA was active during the FD exercise with BCZ. JEY was on vacation for the entire month. WSN had 22 sessions and handled 129 pieces of traffic for the month. GIP renewed his ORS appointment. K7IYR has his tower repaired and is back in business. K7OFW and his XYL, K7OEX are building an Apple and studying hard for their General Class exams. K7BKZ went on a trip to San Francisco. UZB is operating 6-meter mobile. CPF was MC at the Hoot Owl Picnic. IKM has an HQ-170. IVVL/7 7VLC and BJV all made long trips to help with the VARC FD. The Valley Amateur Radio Club made another good FD score. FQD is reported heading home from Germany with his XYL. VLC is installing mobile for a trip back to Annapolis. HMQ and WHV are planning eye-ball QSOs with each of the section ECs. JPH is QRL building and remodeling the new home with lots of space for an antenna farm. BA is having antenna trouble with his five-element Telrex. Traffic: (June) W7HA 1117, DZX 848, QLH 343, K7IEY 327, W7GYF/7 107, K7MFF/7 92, WTAPS 74, ACA 56, AMC 56, GIP 28, OEB 25, AIB 14, BTB 10, USO 10, GAT 1. (May) W7QLH 306, K7IEY 140, W7OEB 20.

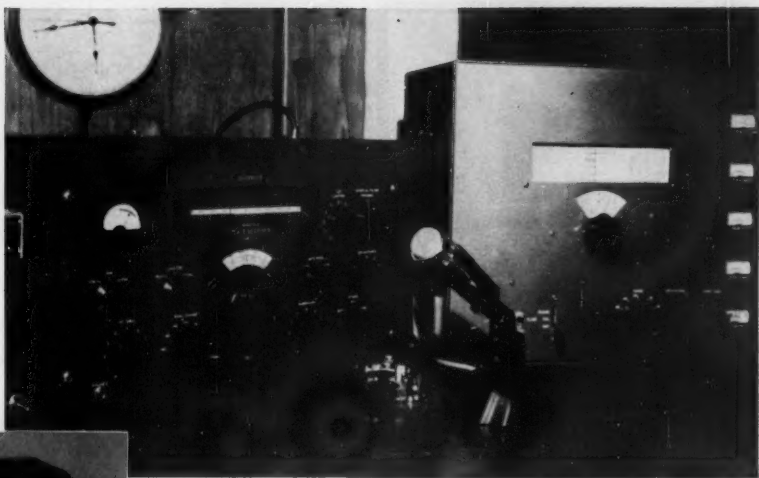
PACIFIC DIVISION

HAWAII—SCM, John E. Montague, KH6DVG—We all owe a vote of thanks to Sam Lewbel, AED, for the great job he has done as SCM for the last six years. KH6BZF is a new OO. The Wahiawa Amateur Radio Club activated KH6DUM/KH6 on FD; operators were DJV, DLJ, DPY, DVJ and W8FOB/KH6 (via WH6DUL). Please send in activity reports; a note to your SCM will bring handy report forms. *Wanted:* Quality-minded amateurs who are interested in serving their fellow amateurs. Whatever your special interest, there is a place for you as an official appointee: ORS and OPS for traffickers OES for v.h.f. experimenters, EC for those interested in emergency work. For more information consult *Operating an Amateur Radio Station* or contact your SCM (address on page 6). Traffic: KH6DVG 200.

NEVADA—SCM, Charles A. Rhines, W7VIU—Ex-QLL of Reno, is now WAZTHG of Elizabeth, N. J. KHU is erecting a new vertical. He moves up to Class 1 Official Observer on the basis of his May FMT report. New officers of the NARA are K7DEF, pres.; K7BJB, vice-pres.; SDE, secy.-treas.; K7LGY, sgt. at arms; CX, trustee; KTAGZ and PC board of directors. K7CMI and NDG spent some time together in St. Mary’s Hospital. EEF is planning a new home. K7JUW and family are moving to Connecticut. AZP received his 2nd-class commercial ticket. UPS is returning from Denmark with a bride. VIU has a new car. CFF sings the praises of his new Comanche. Traffic: W7KHU 100, VIU 1.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—Asst. SCM: Ed Turner, W6NVO. SEC: W6ZRL. PAM: W6ZLO. RM: W6RXY. W6NVO was in New York for a couple of months. K6DYX visited relatives in Ohio. WA6HRS is on the trail of more wallpaper, having sent in the pasteboards for several awards, including WACC. Alpine Co. was the elusive one. The SCARS is actively encouraging its younger members to participate in contests and other ARRL activities. WA6OLQ is the new asst. net mgr. for NCN. WA6BYA worked several new states and is inclining towards WA6 meters. OO W6ISQ reports that only 2 notices were sent out in June. WA6GWM reports there is much activity in the Santa Cruz RC. The members recently toured the test base of Lockheed Missiles and Space Div. W6QWX, K6MZN, W6ISQ and W6CBX came up with some sharp frequency measurements in the May test. And noticed in SCARS Standing Wave News: “Needed: 1 decent receiver for use on 20 meters.” Don’t we all? Reports coming in indicate a successful Field Day for most clubs in this section. The Monterey Bay Radio Club

(Continued on page 116)



Fred J. Pichitino
Phone DXCC No. 28

"surpasses its claims"

...writes Fred J. Pichitino, W8KML, of his
Electro-Voice Model 664 Cardioid Microphone



W8KML, a consistent top-rated DXer, was a ham with a problem. In his words, *"It should be emphasized that my equipment installation requires a highly directional microphone . . . to provide smooth operation of the vox circuit for sideband transmission."* For his operation, W8KML claims of the Electro-Voice Model 664 *"... the cardioid pattern permits greater usable audio loop gain, providing better microphone technique."*

If you — like W8KML — have acoustic feedback problems . . . if you could use up to 12 db more audio (without splatter or hash) . . . or if you simply want to add more intelligibility to your carrier to smash through QRM, we suggest that you give the 664 a good, solid try. We're convinced that — like W8KML — you'll find this

highly directional microphone is *"... highly desirable for communication work and surpasses its claims in difficult operational environments."* Your distributor guarantees satisfaction — or your purchase price is refunded.

TECHNICALLY SPEAKING: Model 664 Variable D Dynamic design principle provides multiple sound paths to the diaphragm. Spaced sound entrances are phased to provide maximum pick-up of all frequencies and complete cancellation of rear sounds. Variable D principle insures a response that is free from dips and peaks. Eliminates effects of blasting and boominess due to close talking. Unaffected by mechanical shock. Exclusive E-V Acoustalloy diaphragm, unaffected by moisture, humidity, and temperature. Convenient ON-OFF switch.

Variable-D and Acoustalloy are registered trademarks and exclusive developments of Electro-Voice, Inc.

Model 664 (without stand)

Amateur Net Price: \$51.00

Model 664 (with Model 419 Desk Stand)

Amateur Net Price: \$57.00

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"The safest way," said Ken, "to double your money—is to fold it over once and put it in your pocket!"

With all due respects to Mr. Hubbard, I'd like to suggest a more realistic way to give your dollars more mileage:

No matter what you buy, you'll always come out money ahead by paying just a little more—to get a lot more! As a case in point, I'd like to mention the new Hallicrafters Model HT-32B Transmitter.

When you consider the features of this unit, the first thing that occurs to you is that it ought to sell for 25 or 50 per cent more than it does!

This HT-32B, for instance, uses a new, hermetically sealed high frequency crystal filter for stepped up stability over a longer operating life.

Second, the HT-32B, which employs an ultra-stable beam switching tube modulator, is the first transmitter guaranteed by the manufacturer to develop an almost perfect side band modulator.

Featuring an 8-band output, all modes of transmission—CW, AM, SSB—a plate input of 144 watts, a full, built-in voice control system, rugged, heavy duty de luxe construction, and many other extras, the HT-32B is among the top transmitters in existence today.

Drop me a card and let me send you a catalog sheet on it. You'll be amazed at how easy it is to save money—by spending it!

Sincerely,

Ward J. Hinkle WJH

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elected WA6CBQ, pres.; K6TEH, vice-pres.; W6DWW, secy.-treas. OES K6HCP reports there is much activity on 6-meter s.s.b. and he is building a 4X150 rig for 432 Mc. with a square cavity. W6ZBJ announced that another of the traffic breakfasts was held at the Red Coach Inn July 16. Traffic: WA6OLQ 342, K6GZ 240, W6FON 142, W6AIT 113, W6YBV 112, W6HYM 102, W6DEF 74, WA6LSS 55, W6ZLO 25, W6OHI 25, K6VQR 15, K6EQE 10, WA6EIC 6, K6TEH 2, K6SMH 1.

EAST BAY—SCM. B. W. Southwell, W6OJW—SEC: WA6HYU. ECs: K6VXK, K6ESZ, W6FAR, W6WAH and K6HTJ. WA6HYU is the new SEC for the section. Please send all AREC-RACES reports and queries to 210 Castle Hill Ranch Road, Walnut Creek, Calif. WA6LX is using the "Six Shooters Net" for an outlet of NCN traffic for Napa. The NYL of K6GK passed away June 8. WA6MHS is secretary of the Richmond ARC. The EBRC held its auction June 9 at John Hinkle Park. WA6ECF has his Hy-Gain three-element beam up and is DXing on 20 meters. His total is 88/53. K6KLY, OES, needs help to work all the stations, states and countries he has been hearing on the 50-Mc. openings. K6INQ has 24 states and 3 countries on 50 Mc. WIHWK visited WA6CNV, whose wife is WIHWK's sister.

All W6 amateurs join with members of the East Bay section in expressing their sorrow in the passing of Horace Greer, W6TI. He served our section faithfully as SCM, conducting our operating-administrative affairs from April 39 to July '51, for over 12 years. He was dedicated for more than 21 years to handling the forwarding of the W6 ARRL QSL Bureau, serving as manager Mar. '38 through July '50. DX and local workers will share in the feeling of a personal loss.

WA6GCS has her tribander up on the tower and ready for DX. WA6IJH, WA6JG, WA6FZB, WA6GJW and W6MBN operated a 40-meter c.w. station on Mt. Diablo during an overnight trip. The station was the property of the Antioch High School Amateur Radio Club. W6PIR is almost on the air at long last! W6LGW is putting up an inverted "V" for 75-meter phone. WA6BBJ was the winner of the HARC Contest K6SP and W6QDQ are new members of the HARC. K6AUR, W6NYK and K6YBS burned the midnight oil to get the HARC Club DX-100 ready for Field Day. K6DKQ has MARS call AFA6DKQ. W6VNF has mounted his 20-meter three-element beam on the roof while waiting for his General Class ticket to arrive. WA6BBJ won third place in the SS by means of 81,280 points. WA6KUN has a new 41-ft. mast and a Heath mobile rig kit. K6KLY won the V.H.F. QSO Party, sponsored by CQ, for East Bay. K7IDH is now living in Castro Valley. W6NCP was QRL flu. HARC is starting new code classes. Contact K6YBS for information. W6VNGH and W6VNF are biting their nails waiting for their General Class tickets. K6RDD has a DX-40, an SX-99 and a 33-ft. vertical and can be heard on 75- and 40-meter phone. WA6LTG has a new Viking II, a Heath VFO and an SX-99. K6SP has a Heath "Sixer." WA6BBF has an 832, 15-watt rig on 50 Mc. W6QDQ is running 25 watts homebrew on 7-Mc. c.w. and uses an S-40. W6CAN is QRL getting the new QTH ready in Nevada City. WA6MHJ is a new NCN check-in from Berkeley. W6NBB is rebuilding. The deadline for news is the 5th of each month; please try to get it to me before that time. Drop a card to the SCM regarding appointments. Traffic: WA6LVX 755, WA6ECF 353, K6GK 300, WA6MHS 28, W6OJW 2.

SACRAMENTO VALLEY—SCM. George R. Hudson, W6BTY—SEC: K6IKV. ECs: K6BNB, K6GOT and K6BYS. OBs: K6AF and W6WGO. PAM: W6GQS. OO: W6WLI, W6GDO, K6ER, W6ZJW and K6EIL. ORS: W6WGO and W6CEI. OES: W6PIV. OPS: W6WGO, K6EIL, W6PIV and W6GQS. Reports indicate Field Day was a smashing success in Sacramento Valley with 57 FD messages received by your SCM and 133 FD operators reported as taking part in the activity. The Northern California Net (NCN) meets daily on 3535 kc. at 0400Z and is in dire need of new members in the Sacramento, Marysville and Chico Areas. WA6CJU is NCS on Fri. with RN6 on 3615 kc. at 0500Z and 0700Z with a new Ranger and keyer. Good luck to WA6LVX, the new manager of NCN, and a "thank you" for a job well done to past NCN manager W6NBB. WA6EHC is a new member of the NCN in Citrus Heights. W6VJH has been almost 100 per cent QNI NCN. WA6JW, in Yreka, also is active in the NCN. W6VII, SARC prexy, worked 7 states and 2 VEs on 50 Mc. in the recent V.H.F. Contest. W6QYX has made 3 sessions of the Trinity County C.D. Net to date and had his first contact using the new n.f.m. with W6JDN. W6ZJW is a new OO. W6WLI has finished the SF assignment and is back home again. WA6IQK has been chosen "RAM" of the month. Congrats, Dave! The MARS program at McClellan AFB is offering a beginner's course in amateur radio and information may be obtained by contacting

(Continued on page 118)

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W6FRQ at Y07-5460. Fellows, a lot of traffic is being handled but is not being reported for inclusion in your column in QST! Please send in your traffic and activity reports on the 1st of each month. Traffic: W6CJU 83, K6EIL 18, W6QYX 4.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The Fresno Amateur Radio Club operated from Meadow Lakes during FD and made over 300 contacts. The Turlock Radio Club operated from Williams Peak with good results. It was reported to be hot and dry. K6OLN has an ARC-5 on 75 meters for both mobile and fixed use. W6LOS is operating from his new QTH. The Turlock Radio Club supplied communications for the Modesto Power Boat Club. Those helping were K6-IXA, K6LRE, W6OFF, W6PZC, W6SQR, W6HAB, K6RPL, W6GYN, W6SKH, W6FEJ and K6ODA. W6HAB is on 1296 mc. K6IXA is using Command gear for mobile operation. K6LRE is converting an RDZ receiver. W6FEJ has a couple of URC-4 handie-talkies on 2 meters. W6NBBK has a 2-meter Pawnee transceiver. W6ADB is active again in traffic and is checking in on NCN. W6ADAU has moved to Clovis and also is active in traffic work. The NCN would like to see some activity in the Bakersfield and Tulare Areas. Anyone interested in traffic work, please check in with NCN 3635 kc. daily at 1900 PDST. W6FXV is building up an s.s.b. transceiver. By the time this comes in print, summer should be over. Let's have more activities and let me know what's cooking your way. I would like these bits of news by the first of the month. Traffic: W6ADB 38, W6EFB 28, K6OLN 10.

ROANOKE DIVISION

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE, PAM: K4IE, RM: W4PED. The Rock Hill RC is busy planning its Oct. 8 Hamfest. Some activities will be held Sat., Oct. 7, as detailed in *Scarab*, which has now reactivated with wider coverage. New members are W4BBSA and W4BKE, the XYL of W4NDH. K4EOS visited with VP7NQ in June and has been active on 15 meters. K4HQ is active in traffic-handling and made the BFL in June. W4WIV, W4DEN and W4TLC were active in the June V.H.F. QSO Party and should have nice scores. Two new members of the Greenville Mike & Key Club are W4BRW and his XYL, W4BRV. K4KCO has been approved as OPS. W4FFH and K4AVU continue to be extremely accurate in Frequency Measuring Tests. The SCN, on 3795 kc., is considering moving down near the RACES frequency and contemplating also to use 7113.5 kc. as an emergency alternate daytime frequency. K4NZE is active on SCN this summer along with the Clemson boys. Traffic: K4ZHV 342, K4WJR 332, W4AKC 144, K4HQU 138, K4KIT 85, K4BRP 75, K4AVU 50, K4UOH 50, K4HDX 46, W4HDR 30, K4HJK 21, W4GQV 16, K4OCU 16, W4TWW 16, W4WIV 14, W4CHD 13.

VIRGINIA—Acting SCM, H. J. Hopkins, W4SHJ—SEC: W4VMA, W4QDY has departed for K6-Land and W4SHJ, just returning from overseas, assists with the SCM duties. W4ZM finally made DXCC while world travelers W4KFC and W4SHJ enjoyed many fine eye-balls with the DX themselves. W4IA and W4UJ bemoan the conflict twist net time and daylight saving and W4BZE suffers from fishing pox. W4RRX is QRT for rebuilding and W4ATQ is moving to Maryland. Let's hear from you /3, Claude. An interesting new award issued by the RARC should prove very popular. Contact W4JUI or K4AL for details. All reports indicate everyone had an enjoyable and profitable FD. The VFN Picnic was again enjoyed by all attending. Reports were received from every kind of field appointee this month—OBS, OPS, ORS, OES and those unsung heroes, the OOs. Hat's off to all of you field appointees who, in spite of the pressure of seasonal activities and conditions, continue to deluge the SCM's office with monthly reports. Traffic appears to be above average on nets of all modes, despite lack of originations from within the section. A new net is the Cavalier Fone Net with K4MLD at the reins. Some ECs still are needed. If interested, contact W4VMA. Continue to send reports and correspondence to the address of W4QDY, W4PFC, W4FOR and K4PQL made the BPL. Traffic: (June) K4PQL 524, W4FOR 368, W4DLA 139, K4MXF 122, K4YZT 122, W4-LK 106, W4WO 98, W4OOL 90, K4FSS 58, K4QIX 52, K4AL 42, K4UVT 36, K4IP 34, K4PQV 31, W4RHA 30, K4QO 28, K4DCN 24, W4ATQ 21, W4BZE 18, W4IA 16, W4RRX 12, K4MLD 12, W4TE 10, W4AD 8, K4WAV 7, K4LTK 7, K4ASU 6, K4PRQ 5, W4KX 3, W4OAV 2, W4PRO 2. (May) W4IA 24, K4PRQ 10, K4IAN 6. (Apr.) W4FOR 145.

WEST VIRGINIA—SCM, Donald B. Morris, W8JWM—Congratulations to VMP, who was named West Virginia outstanding amateur at the West Virginia Hamfest, 88A, of Bluefield, will be the general chairman for the 1962 (Continued on page 120)

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event. 4AKC, Vice-Director of the Roanoke Division, attended the hamfest. FNI was appointed PAM and will be assisted by NYH. LOU will be the WVN Net Manager and will be assisted by K8JLF, HZA and K8HID. It is with deep regret I report the passing of SPY, of Morgantown. The West Virginia State Radio Council met at Jackson Mills during the hamfest and K8HID showed films of the special train which will tour the state advertising the Centennial. HZA now operates on 6 and 2 meters along with his 80-meter traffic work. K8-BLR has 45 states worked and confirmed on 6 meters. West Virginia loses another top c.w. man with "PBO" moving to Michigan. All active state radio clubs should be represented on the State Radio Council. Write your SCM for details. K8MNG and GQE took top honors in the West Va. QSO Party. The Marion County Emergency Net meets each Thurs. at 9 P.M. on 29.3 Mc. with GQE as EC in charge. Traffic: W8HZA 22, K8LOU 17, W8JM 12, DYA 4, GAD 3.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald S. Middleton, W0NIT—SEC: SIN. PAMs: CXW and IJR. RM: MYB. OBSS: K0DCC and K0EPD. The following cities reported Field Day club activity: OUI Denver, K0QMH Montrose, RKZ Grand Junction, K0AUT Colorado Springs and EM Boulder. Congratulations to the Ogden Amateur Radio Club and the Salt Lake City Amateur Radio Club for their successful hosting of the Rocky Mountain Division Convention in Ogden, Utah, on June 17 and 18. SIN, Colorado SEC, won the transmitter hunt trophy and NIT, Colorado SCM, brought back an HQ-110. The five original members of the Coffee Club organized in 1947 met with RQD and OM for a reunion in Alamosa. PGX, DDM, COWP, HAF and BXH were present. K0-YLI was appointed by the Pueblo College Radio Association to succeed K0YLA as editor of CTNN. OVQ, Denver Area EC, reports that its AREC membership is at an all-time high. Fully half of the members have mobile capabilities. WWD made the BPL Traffic: K0-WWD 309, W0FEO 283, K0RTI 200, W0MYB 101, K0DCW 85, W0PCWD 44, K0QGO 44, LCZ 26, W0-SIN 1.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, Jr., 70CX: SEC: K7BLR. The Rocky Mountain Division Convention was held in Ogden June 16-18. Though the attendance was a little disappointing, the convention was considered a success where program and prizes were concerned. The UARC (Salt Lake) held its annual Field Day in Big Water Canyon. Two transmitters were operated during the 24-hour period with about 15 operators taking part. FSC, COK, NHX, HIX and STI provided communications for the fifth running of the Great Salt Lake Road Races. Only one EC turned in a year-end report for 1960. Salt Lake AREC Net check-ins have declined during the past few weeks. VEO is married. Band conditions for BUN have been real rough. Traffic: W7OCX 122, QWH 10.

NEW MEXICO—SCM, Newell F. Greene, K5IQL—Asst. SCM: Carl W. Franz, W5ZHN. SEC: BQC. PAM: ZU. V.H.F. PAM: FPB. RM: ZHN. All nets will return to winter schedules and frequencies on Oct. 1. It's been a fine summer for QRN: not so good for QNI. Thunderstorms featured the first evening of FD for most mountain-toppers. CK/5, MYM/5, SGA/5 and K5QIN/5 were among the hardy groups to venture out. VC and his tall tower have moved to El Paso and his XYL, K5GYZ, will represent the LCL and other YL nets from there. Amateurs interested in joining CAP should see FPB, K5QIN and K5TIC for new ECs. Six Albuquerque hams boast the first U.S. Charter of the Certificate Hunters Club. V.h.f. Ed Tilton got a taste of the pile-ups on New Mexico 6-meter boys while operating here in the June QSO Party. Says: "All they wanted was an N.M. QSL!" Traffic: W2MTA/5 234, W5UBW 47, K5IQL 26, ONE 26.

WYOMING—SCM, L. D. Branson, W7AMU—SEC: IAY. The Pony Express Net meets Sun. at 0900 MST on 3920 kc. The Wyoming Jackalope Net meets Mon. through Fri. at 1200 MST on 7235 kc. for traffic. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. The Shy-Wy Amateur Radio Club at Cheyenne held Field Day activities fifteen miles north of Cheyenne with eight operators on duty. YVW and K7HKD held Field Day activities at Cheyenne and reported conditions were good. The Casper Amateur Radio Club held Field Day activities at its club house using an emergency power plant and reports a nice score. UFB reported five operators held Field Day activities on v.h.f. frequencies eleven miles southeast of Casper. Two of these operators were AREC members. GUX, the Sheridan Radio Club, held Field Day activities at Sheridan and reported a good time and a very good score. Traffic: W7AMU 21, HH 14, AEC 5.

(Continued on page 122)

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SOUTHEASTERN DIVISION

ALABAMA—SCM. William D. Dotherow, K4AOZ—SEC. K4JDA. RM: W4RLG. PAMs: K4BTO and K4PFM. New appointment: K4PFM as PAM. New officers of the Birmingham ARC are K4AAU, pres.; K4TJG, 1st vice-pres.; K4FQE, 2nd vice-pres.; K4SSB, secy.; K4PZH, treas.; W4HVE, D.E.C. W4EOH was elected to a 2-year term on the Board of Directors. AENP Net certificates were issued to K4WSL, K4BOR, K4PRE, K4DJR, K4AVM, W4DFE and W4MEP. AENP NCS certificates have been issued to W4YER, W4OQG, K4DSO, K4TVZ and K4KHC. K4ZNK has received the Southern Belle Net certificate. K4ZNK reports there are approximately 260 hams in Montgomery with only 6 YLs licensed. The Montgomery hams handled communications for the Annual Powder Puff Derby, with 22 operators participating. Winners in the recent AENT Contest were W5DTR, W4HSR, K4TTA, K4ZXX, K4DJJ, W4MKX and K4SAV. W4RLG welcomes to AENB, K4RYI and K4PWE from Mobile and K4TRJ from Jasper. Congrats to K4ZYI on receiving an AENB certificate. K4TRJ is president of the new Walker County ARC. Sorry to lose K4RCA, who has been transferred to Keesler AEFM. K4HJM has modified his rig for f.s.k. v.f.o. K4KDE and K4TJG are back from 2 weeks at National Guard camp. Welcome to W4NBQK, the XYL of K4DJR, a new Novice in Dora. W4CIU reports that W4HPE is on active duty in the Marines. K4RIL reports that the Muscle Shoals ARC had a nice Field Day outing. K4WHW, Field Day chairman of the Decatur ARC, reported a successful event with 4 rigs in operation. K4UPL is very active in the New York City nets and 2 a.m. nets. W4OXU reports that all members of the Springville ARC participated in a demonstration at the local high school and handled 47 messages. A new station in Springville is KN4BDW. K4WNM has dropped the "N." K4GRA has a new Viking Ranger and an NC-300 with drooping dipoles for all bands 80-10 meters, and is operating full break-in on c.w. using a Montgomery electronic keyer. WN4BDW, who runs a TN-75 at 12 watts and receives on an SX-110, worked Michigan with 12 watts. K4LNA reports the Shades Valley High School ARC operated K4OBG/4 on Field Day and made over 500 contacts on c.w. and s.s.b. Stations participating were K4LAY, K4LNA, K4UPL and K4ZUW. Siz Meter News: K4UMD welcomes W4KWW and W4JJS to AENO. K4UMD has erected a new 60-ft. tower to hold his tribander. W4GVW and K4QMH are on 6 meters from the Jasper Area. W4UAR, W4WGI, K4IKU, OES, report plenty of band openings during June. W4WGI is operating on 144 Mc. with a 150-watt transmitter/exciter and a long yagi on a new 50-ft. steel tower. W4WGI reports W4CTG is back on 144 Mc. with a new 48-element tiltable array. He is high on top of Mt. Sano (1800 feet above average). K4IKU has completed a 6CX8 mobile transceiver with a double conversion for 6 meters. Traffic: (June) K4PFM 98, W4RLG 94, K4HJM 83, K4AOZ 64, W4KIX 54, K4PHH 53, W4PVG 51, K4LNA 42, W4YER 39, K4YUD 34, K4KDE 22, K4BTO 19, K4KHC 16, W4MI 11, K4TRJ 9, W4WIF 9, K4GXS 8, K4ZBX 8, K4ZNX 8, K4TJZ 7, K4RIL 6, K4WVB 6, W4WVH 6, K4AAU 5, K4UJZ 5, K4TVZ 5, K4GBA 4, K4RCA 4, K4UMD 4, K4DJR 3, W4DS 3, W4DGH 2, K4TDJ 2, (May) W4OKQ 112, K4UPL 75, K4AWSK 56, W4OXU 53, K4WVD 33.

EASTERN FLORIDA—SCM. Albert L. Hamel, K4SJH—SEC. W4IYT. RM: K4KDN. RM RTTY: W4EHU. PAMs: 40. W4SDR; 75. K4LCP, v.h.f., W4RMU; s.s.b., W4CNZ. Section nets: EPTN, 2945 kc. M/S 0700; FMTN, 7230 kc. M/S 1200; TPTN, 2945 kc. daily 1730; GN, 7115 kc. daily 0830; QFN, 2650 kc. daily 1830 and 2200; FEPN, 3910 kc. Tue, 1830; FSNB, 3940 kc. Sun. 1700; FAST, 3940 kc. M/F 1930; NHN, 3725 kc. Sun. 0730; MCEN, 3900 kc. Sun. 1330. All net managers are requested to send information on their nets, whether traffic or emergency, to the SCM for inclusion in this column and for organizational assistance. There are some operators who won't handle an occasional piece of traffic even though they are the only ones in the area needed. The number of s.s.b. stations in traffic work continues to increase but traffic reported from s.s.b. nets is negligible. A good net handles traffic in preparation for that emergency—and reports it to the SCM. By now, K4ENR should be well on the road to recovery. June 1, K4RNS is tops for certificates. Bet W4QLT/MM has had enough for this year. K4BZ has been going aero-nautical mobile on 6 meters lately. The Orlando Club bought an HT-37 and an SX-111 for AREC/c.d. work. It is reported that 6- and 2-meter activity is up but OES applications are woefully down. V.h.f.s. drop me a card or a hamgram for the dope on this fine appointment. W4GOG and W4UBS report. Traffic: (June) K4SJH 603, K4LCP 266, K4COO 197, K4KDN 179, K4DBT 160, K4BY 147, W4AKB 138, K4EYH 136, K4LYX 131, K4VSA 100, W4ARV 99, K4ENW 85, W4FE 85, W4EAT 83, K4RNS 82, K4OZS 80, K4FQS 76, K4AKQ 72, W4TRS 72, W4IYT 71, K4BHL 70, K4FMA 62, W4DVR 60, K4-

(Continued on page 124)



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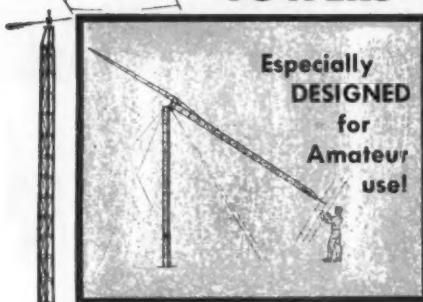
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ILB 54, W4AZJ 32, W4CNZ 31, W5ESB/4 47, K4ANR 44, W4NGR 43, K4BZ 42, W4QVJ 39, W4LMT 38, W4RMC 24, K4HSS/4 34, W4TUB 32, K4AX 31, W4LSA 29, W4EHW 27, K4MTP 27, K4RDX 27, K4YNSN 27, K4WIP 25, W4BKC 23, K4DAX 23, K4ENW 21, K4YPS 17, K4ZIF 17, W4VCX 16, K4VNA 16, K4RBB 15, K4YVB 15, W4DDW 13, K4OSQ 13, K4AD/4 12, K4JZX 12, W4YAD 11, W4BHZ 10, K4JZU 10, K4JZJ 9, K4BZK 8, W4SMK 8, K4PXY 4, W4BP 1, (May) W4FCO 3285, W4WHK 175, K4ILB 70, K4YLX 61, K4BZ 59, W4SGY 22, W4DQS 7.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC, W4MLE, PAM: W4WEB, RM: W4RBR, Tallahassee: The Florida Forest Service has asked Florida AREC aid in providing communications to FFS District Offices throughout the state. The new State AREC Plan and Procedures is available from Fla. Skip, W4YT or W4MLE. It will get a good shakedown during the SET in October. Tallahassee has adopted 29,500 kc. for its local intercom net. Panama: W4IAP is becoming active on 10, 40 and 75 meters after a long lapse and will provide a much-needed outlet for Wakulla and Franklin Co. traffic. Quincy: K4EYC is active on WFPN, and has a TA-33 beam up for 20-, 15- and 10-meter DX. Ft. Walton: The EARS, W4SRX, ran up over 500 contacts in Field Day, the highest in its history. The Pensacola ARC, K4ALI, did even better with over 600. The Panama City and Tallahassee Club groups also were out for the occasion. The AREC meeting in Ft. Walton was a big success; plans were made for a slow-speed c.w. net starting in the fall. Pensacola: The PARC held an impressive ceremony installing its new officers. The new prexy is W4SRK, while the PARCA will be headed by Eleanor Weeks, the XYL of W4OOW. W4-AXP, the old faithful on c.w., finally has bought a phone rig! Traffic: (June) W4MLE 170, K4JDW 69, W4WEB 49, K4LOL 25, K4BDF 22, K4VNS 18, K4ZMV 5, (May) W4SRK 236, K4CNY 213, K4LOL 31, K4BDF 9, (Apr.) K4CNY 276.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: W4PMJ, PAMs: W4LXE and W4AOH, RM: W4DDY, GEN meets on 3995 kc. at 1830 EST Tue. and Thurs. and at 0800 Sun. GSN meets Mon. through Sun. on 3395 kc. at 1900 EST and 2200 EST, W4DDY as NC. The 75-Meter Mobile Net meets Sun. on 3995 kc. at 1330 EST, K4YID as NC. The GPYL Net meets each Thurs. on 7200 kc. at 0900 EST, K4ZZS as NC. The Atlanta Ten-Meter Phone Net meets each Sun. on 29.6 Mc. at 2200 EST, W4BGE as net mgr. The Georgia S.S.B. Net meets Mon. through Fri. on 3972 kc. at 2000 EST, K4RIB as net mgr. The Atlanta Radio Club Phone Net meets at 2100 EST on 21.36 Mc. each Sun. W4DOC as NC. Field Day messages were received from K4IRU/4, W4BTI/4, W4BEM/4, W4MQN/4, K4SZF/4, K4ZYI/4 and K4TBN. K4ZYI has a full-size three-element 50-meter beam and also made BPL for the first time. K4RWM would like to reorganize the GTN Net. Contact him if you are interested. Glad to have K4LEM back handling traffic again. K4TKM and K4TEA sent to Macon, Ga., to operate FD with W4YWX, W4YAW, K4RAB, c.w., with the Middle Ga. Club under K4VEW/4. K4VTH now has an SB-10. The ASTRO made a good score on Field Day. K4PKK has a Communicator IV on 6 meters. W4LNG added a 6CW4 Nuistor to his old 144-Mc. converter and it sure helped the unit. Sue Wright, K4BWQ, is quite active in Calhoun, Ga., on 20 and 40 meters. Don't forget to renew your ARRL appointments, and keep your membership up so you can hold your appointments. Traffic: K4ZYI 515, K4FPZ/4 202, K4EKM 116, W4DDY 113, K4BAI 94, K4RWM 60, K4FJD 54, K4QPL 53, W4HYW 34, K4LEM 33, K4TEA 23, K4VTH 5.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: AAA, C.D. Radio Officer: MC, BAN, Hato Rey, joined the AREC. He uses a Gonset G-50 and a Telrex six-element beam. The PRARC Beach, Ponce, at Vacia Talega was attended by 45 licensed amateurs and their families. The PRARC presented its golden "Merit Award" diplomas to AEB and ZC for their work during Hurricane Donna, and to AVB and AFA for advancing the art of 50 Mc. Civil Defense has sent letters to the 100 members of the PRARC asking for their participation in the RACES Plan. The first meeting was held July 7 at C.D. Hq. in Rio Piedras. The Manzanet, on 2810 kc. Mon. Wed. and Fri., has changed roll call time from 2100 to 2130 GMT. DJ added a 21-Mc. dipole to the multiband array using one 75-ohm kw. twin-lead feedline for operation on 80, 40, 15 and 10 meters. VP2-DU, a member of the Antilles Weather Net, lost all equipment in a fire and is back on with a DX-60, an SX-99, a dipole cut for 7245 kc. and a 300-watt emergency power plant. DV has a new Invader and an HQ-170. KP4ZC has a new fishing boat but spends some time on 40 and 20 meters using 850 watts a.m. KQHF/KP4, from Wichita, Kans., was Class B in the FD from Fort Buchanan, making 31 contacts for 103 points. He uses an AF67 and a "V" beam 138 feet each leg. AQY

(Continued on page 128)

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A highly efficient, 185 watt AM, high power VHF transmitter for full coverage of the amateur 6 and 2 meter bands and associated Mars frequencies.

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This beautiful unit with its ultra-stable VFO is the ultimate in VHF equipment for amateur and Mars operation.



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From New Hampshire: **Richard E. Hayes, K8UXU**

"... We feel that our new Zeus is the best thing that ever happened to us since we have been in ham radio (5 years)..."

Hazen & Beatrice Bean, K1JFQ

From Florida:

"... We are well satisfied with the results of this unit as we have worked forty DX contacts in little more than three hours on May 23, 1961, including six new states which we were unable to work in the past two years with a 120 watt, 6 & 2 transmitter of a different mfg..."

From California:

Jack Edlow, K4YIW

"... Never before have I been more pleased with a piece of gear than I am with my Zeus. In two days I have worked 24 states with several contacts in each, (phone) on six meters. And the signal reports — yow! For the most part unbelievable..."

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From Pennsylvania:

"Words cannot express the pleasure and performance of ZEUS. I have worked 5 states 5-9, plus I have given you \$1,000,000 advertisement..."

From Puerto Rico:

Dr. A. Schlechter, K30EC

"... I want to inform you of the excellent results obtained with the Zeus Transmitter I bought one month ago. Taking advantage of the band opening, I have been able to work up to the present thirty-eight states, including California..."

From New Jersey:

Pedro Fullana, KP4AAN

"... I would like to tell you I am more than delighted with the operation of the Zeus. Have had nothing but good reports from other Ham's..."

Donald E. Gillmore, WA2QCQ

From Georgia:

"... This set is terrific. I've had terrific results with it. It's the best rig — ever."

George E. Missback, K4QOE

K8CHE in Ohio tells about 99'er

"... with the 99'er haywired in from a four element beam, through 100 feet of coax, through a matching network, through a length of 72 ohm twinlead, and then through a length of 300 ohm twinlead to reach the 99'er, we could read the Michigan stations Q5! and back through the above haywire we were able to put 4.4 watts into the antenna as measured by a RF ammeter!..."

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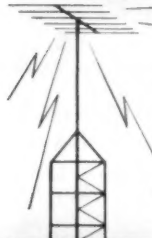
The 262 contains the identical RF sections of the 2 meter 242 and the 6 meter 243 transmitters on one chassis, with a single 242 audio and power supply section. The only switching necessary to change bands is in the filament circuit. The separate RF sections make RF switching unnecessary, providing the same high efficiency of single band transmitters. Each RF section has its own tubes and circuits, comprising 4-5763's as oscillators and drivers, 2-6146's as final amplifiers, 12AT7 crystal mike amplifier, 6V6 audio driver, 2-6V6's class B 100% push-pull plate modulator, 5U4G rectifier. Two separate antenna outputs are provided with coaxial connectors on the front of the transmitter. These are connected to swinging links, controllable from the front panel, matching antennas from 52 to 300 ohms. The 262 uses standard 8 mc. crystals and will operate with the Lettine VFO. A socket is provided at the rear for relay connections. Cabinet 8 x 17 x 8 inches. Weight 32 lbs. Will operate mobile from a 12E-103 dynamotor. Completely wired and ready to operate.

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and ATV also were Class B from Casa Lomas Aguas Buenas, according to FD message received by the SCM via KØQHF/KP4. CH built a separate power supply for V.F.O. and his son took the Novice class exam. ABD has Gonset-100 and 101 ready for his son just out of college. AXN is loading a 40-meter antenna on 80 meters with a DX-60 but plans a better radiator soon for 3810 kc. BJ skeels brother K4PUJ at Washington, D.C. on 21,075 kc. at 2200 GMT Mon., Wed. and Fri. AFS, on vacation from the Army, Augusta, Ga., is at Orocoris with a Viking I, a BC-342 and a 7-Mc. dipole. HG moved from Mayaguez to Bayamon. K6AIW/KP4 is a USWB radio technician living at the Los Angeles development near the International Airport using a 100V and a Drake 2A. AZ is waiting for a replacement audio transformer for his GSB-100. AZB, one of the newer KP4s, uses a 32A-33 combination in Hato Rey, PR. WT says she will be a grandmother for the tenth time in October. Radio amateurs made the newspapers in San Juan when they helped search parties at El Yunque Mountain search for the lost nine-year-old daughter of an American serviceman. AZJ, at Vieques Island, would make BPL every month if he reported the traffic we hear him handling. Also AWF, at Roosevelt Roads, PR, propagation conditions prevailed almost daily during June on 50 Mc. AAN worked 38 states and Nova Scotia on 6 meters during band openings in June. ALY is the first KP4 to earn the WPR-100 Award for all-50-Mc. operation. The award was dated June 13, 1961. W4MBB, Miami, Fla., is the first stateside amateur to attain a WPR25 Award for all-50-Mc. operation. The award dated July 3, 1961. 2-Mc. activity on 145,000 was supplied by IAN with Clegg Zeus, a 17-element Yagi and a VHF-126 converter into a 75A4. CK runs 60 watts to a sixteen-element stacked array and a Neil TRF receiver. JM uses a new Polycorn and a VHF-126 converter, AAB a Lettine and a VHF-152, ABN a Viking 6N2 and a VHF-152. AIS and AHF both have Senecae and crystal converters. The following nets will be handling weather and emergency traffic should the agency and navy at present their schedules are Antilles Emergency Weather Net, 1100 GMT daily on 7245 and 3805 kc. simultaneously; Antilles Emergency MARS Net at 2200 GMT Mon. on 40 meters; Mango Traffic Net at 2130 GMT Mon., Wed. and Fri. on 3810 kc. Traffic: KP4WT 163, AYZ 8, DJ 8, KØQHF/KP4 3, AQY 1.

CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD—MQ has moved from his original QTH to Balboa where he is set up with TD's old ground plane. LC's new 20-meter beam is up and Len now is packing a solid kw. punch on s.s.b. SW reports good results using a tri-band antenna. Your SCM, TD, on vacation in the New York City Area, spent the July 4th week end in Long Island at the QTH of W4UCR, also visited newly-elected SCM W2OBU and had a nice eyehall QSO. Outgoing SCM W2TUK, an Ex-KZ5, phoned for a nice chat. Will report on attendance at a New Jersey DX Association Club meeting at the QTH of W2FZY. Hope to have a more complete report for July.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—SEC: W6LIP, RM's: W6BHG, W6AROF, K6LVR, FAMS: W6BUK, W6ORS, K6PZM. The following stations earned BPL for the month: W6WPF, W6GYH and W6AGKK. Congrats, fellows! From reports received, it looks like Field Day was very successful in the section! W6WPF reports a wonderful group of young traffickers. W6GYH was visited by W6OHJ. W6DJB reports fine work in the V.H.F. Contest. W6CIS ran 7 watts from the High Sierras on FD. W6SRE and family are spending the summer in Alamitos Bay. W6AROF, formerly K6CLS/6, is now on 6 meters with a Harvey-Wells rig. K6GLS put up a new NY-Gain doublet. W6MFM and W6QFC have a new Gonset G-50 on 6 meters. W6MFM is a new NCS on the SoCal 6 Net! W6AFXJ has a new quad and a 45-ft. tower. W6BUK is being kept out of trouble painting the house! W6OWM is a member of the TVI Committee. K6MGO reports the SoCal 6 Net is moving the traffic very well these days. K6KJ now is operating from BVUS and sends 73 to the gang. W6DPV is at the Coast Guard Academy. K6SIX reports many fine 6-meter openings. W6BFC reports fine work by the AREC during the Azusa Fire. The Douglas-Santa Monica Amateur Radio Club had a fine job at the Scout-O-Rama and is now affiliated. W6KVS is starting Project Oscar tracking gear! Support your section nets! On phone the SoCal 6 Net which meets at 0200 GMT on 50.4 Mc. daily; on c.w., the Southern California Net which meets at 0300 GMT on 3600 kc. daily. Traffic: (June) W6WPF 1069, W6GYH 975, W6AGKK 586, W6AROF/K6CLS/6 512, K6OZJ 429, W6EXB 268, W6MFM 167, W6ABHCZ 102, W6BHG 97, W6LYG 90, W6QFC 90, W6DJB 80, K6SIX 80, W6USY 78, W6AJOC 53, W6KQN 53, K6ATB 52, W6OUC (Continued on page 128)

A 30-SECOND QSO



QRA?

SYLVANIA

QRU?

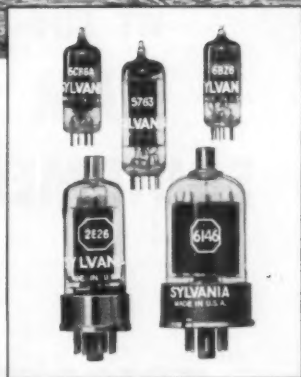
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NORTHERN TEXAS—SCM, L. Harbin, WJ8NG.
Asst. SCM: E. C. Pool, 5NFO, SEC: K3AEX, PAM;
BOO, RM: LR. Field Day operation was hampered in
some parts of the section by heavy rains, but everyone
enjoyed it as usual. Some of us seem to forget the real
purpose of Field Day and do not go as well prepared as
we should. One FD group had previously erected permanent
antennas and when they returned to the location
found that the towers had been blown down and the
antennas stolen. That was hard luck but I think the antennas
should be erected just before operation is to start. FD
messages were received from CF, F, TGP, SJZ, VFM,
K5AXA, K5LKI, K5LZW, K3MQT and K3OJ1.
Two other messages were received but did not include the call
used. A word of caution, be sure to get all information
on any emergency message you are requested to relay.
Recently I received a message requesting help for a
town that had been hit by a tornado. I am hoping for
commercial communication and in the need of help. A
(Continued on page 130)

(Continued on page 130)

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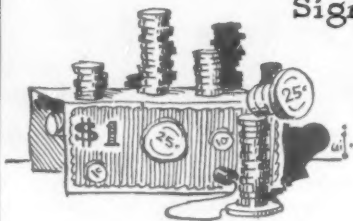
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in preamplifiers — the first system having less than 0.1% distortion; exclusive "step up to stereo" design; matched tone control components for exact "flat" settings with infinitely variable controls; a high gain circuit which is completely free from overload problems.

by the customer without any external test instruments. The customer-built and aligned unit will equal or surpass, in terms of sensitivity, selectivity, and distortion, any other FM tuner currently available. With the extension of DYNA-developed etched circuit designs to FM tuners, the inherent advantages in precise layout and reproducibility are dramatically emphasized. The DYNATUNER sets a new standard for ease of assembly, simplicity of operation, performance, stability and dependability.

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check of the area failed to disclose the location of the tornado. Several amateurs in the Ft. Worth Area took part in a search for a 14-year-old boy who had disappeared and later was found asleep in the rear of a store in his neighborhood. FHW, ATR, YUO, WKH, YIJ, EIP, RHZ, SXX, BCB, PAW and OQMG/5 were on hand to furnish communications for the searchers. K5-TMR has a new Viking II. The Caravan Club's new officers are K5AMF, caravan master; K5DPL, asst. caravan master; CAS, secy-treas. Traffic: K5QWR 608, ILL 203, W5BKH 114, BOO 80, K5YPO 61, W5GY 33, K5PXV 23, QRG 19, ZOM 19, W5CUI 9, ANK 8, AWT 4.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—A card from W5VNC mailed in Japan states that it looks like he is going to get further from home before he gets back. K5GNX and K5OCX are new ORSS. K5ZCJ is a new OPS. Since K5VTA will be in college, his father, EHY, will be the new EC for Sequoyah. K5OVI was Field Day chairman at Bartlesville. K5s DPD, EHC, KOF and CKP are new Generals being heard. Amateur radio received much favorable publicity during Amateur Radio Week in Oklahoma, June 18 to 24, which was made possible by an official proclamation from the Governor. TLL and the Lawton-Ft. Sil Club did an outstanding job on Channel 7 television there. Both Oklahoma City papers and television carried good stories with the help of Tulsa and UYQ in Oklahoma City. Radio and newspapers in several other cities, including Bartlesville and Enid, also carried good stories. The SCM received FD messages from GU, CVU, CUQ, K5-VOZ, K5VTA, K5LRU, K5IBZ, K5SAM, NS, CXU, HMF, HTK, EM, K5LNR and ODM, all operating portable. The SCM has been off the air and hopes he did not miss any messages. Oklahoma boasts of one of the outstanding clubs of the nation, the OCARC. Traffic: (June) W5OOF 136, K5IBZ 88, MBK/5 78, OCX 61, W5FEC 49, K5DLP 36, ZCJ 24, AUC 19, W5MFX 17, UYQ 17, K5LZF 16, W5CCK 14, DRZ 14, WAF 13, WDD 13, DFH 11, K5JOA 9, VNJ 9, OOV 5, CBG 4, HQE 3, W5VLW 2. (May) W5WDD 18, JXM/5 9, WAX 2.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—It is certainly good to see Texas forming up on an excellent c.d. plan. K5TRY and everyone connected with it deserves a great many thanks, as a lot of thought and work has gone into it. K5FPJ is the new EC at Beeville. Anyone missing the South Texas Emergency Net's Convention at Victoria certainly missed a good one. New officers for the net are CIX, net control; K5-PPV, alternate; EV, second alternate; DIV, secy-treas.; RLZ, net PRO. K5RDP is the proud possessor of a new Drake 2A and K5FBY a Webcor tape recorder since the convention. Through the efforts of our Director, QKF, the week of June 18 through 24 was declared Amateur Radio Week by the Governors of Texas and Oklahoma and by the Mayor of Corpus Christi. The Houston Amateur Radio Club had 15 members working Field Day. The Corpus Christi Amateur Radio Club had 10 besides the XYLS. The 7290 Net had 44 sessions, 1410 stations and 325 QTCs. Mobiles in the Houston Area provided communications for the car races held in Galveston. DNE has a new Buick with a home-built 500-watt transmitter. The Houston Harris County Hamfest is to be held Oct. 7 and 8. OX is chairman.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: H. C. Hillyard, VO1CZ and A. E. W. Street, VE1EK. SEC: BL. Congratulations to LT and his XYL on the arrival of a new daughter. Ex-ZQ is now signing VE2BHD from Montreal. VE3CIR/VE1 is operating on 80-meter c.w. from the Forestry Station near Fredericton. MZ had an unwelcome visitor recently in the form of lightning, which caused considerable damage. LY reports good results with his new three-element beam on 20 meters. A number of v.h.f. enthusiasts recently held a successful outing at the Digby Pines. AP has been added to the list of those receiving Old Timers' Club certificates. Please note that all amateurs who have held a call for 20 years or more qualify for membership in the Old Timers' Club and an OT certificate. It would be appreciated if those who are eligible could contact this office giving details as to the date of issue, present call and brief resumé of amateur activity. VOIC reports that he is temporarily QRT while completing an electronic technician's course with the Navy in Halifax. Where are the traffic reports? Let us show the other sections that the Maritimes handle traffic too! Traffic: VE1OM 17, WB 13.

ONTARIO—SCM, Richard W. Roberts, VE3NG—DNZ is visiting the YLRL members in W6-Land. BQP is s.s.b. DAR is on vacation in the Huntsville Area. MG had a nice write-up in the Toronto A.M. paper. AJA is a resident at Trout Lake (North Bay). LK visited the VEIs while on vacation. PR is in the hospital. The Ni-

(Continued on page 132)



LEE PAUL, K1LCV, covers the non-business aspect of his Raytheon activity via QSO with other members of the company's world-wide field team.

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agara Radio Club of Niagara Falls, N. Y., will hold a convention Sept. 15 to 17. Contact K2AJY for information. The Windsor gang really is getting hot on the Ontario ARRL Convention to be held Sept. 29. CNK is chairman. Let's all go to this one. The Westside ARC reports that the following were on during the V.H.F. Contest: AIB, CYB, CUY, ATB, CRD, CWN, DHG, BYY, UT and DBY. North Bay's ARC has come up with a beautiful crest and decals. The Nortown Old Timers of Toronto now is affiliated with ARRL and has 100 per cent ARRL membership. How about that? DUU does a fine job on calling the Ontario Phone Net to order. The Ontario DX Assn. is headed by CYL. NF was a visitor to Toronto recently. DWN is now holder of an A-1 Operator certificate. DLS reports that EFM will monitor 144.144 Mc. in the Toronto Area 18 to 20 hours per day. Nortown and Scarboro are contributing towards the equipment. CRK and CII are now Class A. EUY is a newcomer. CIF is on mobile. DHS does an FB job on the *SeaWay Valley Bulletin*. CUM was fishing in VE2-Land recently. JAM was on from Ottawa during the Boy Scout Jamboree. CO had a busted foot but is better now. BFL is mobile. TM has a new station and antenna. Traffic: VE3AIL 140, NG 139, DPO 97, CYR 75, BAQ 66, BUR 44, DTO 42, EHL 37, EAM 34, DWN 19, BH 17, DU 14, AUC 9, VD 5, GBN/3 3. (May) VE3TM 41.

QUEBEC—SCM. C. W. Skarsteit, VE2DR—Glad to receive a report from Noranda through AZG, who informs us that the Rouyn Noranda Radio Amateur Club has five active and ten prospective hams. Those active are MA, SL, AUW, AXM and AZG. AXM is interested in c.w. on 40 meters, AUW in phone on 75 meters while AZG hopes to do a bit of traffic before soon. MA and SL are less active because of the pressure of business. HE, at Hull, puts out a good 75-meter phone signal. W2SNJ used his mobile effectively while visiting Quebec and Ontario. The St. Maurice gang held a Ham "Pique-nique" at St. Edouard Zoo. Sorry to report that AEM experienced his first silent month since 1931 because of an operation. We learn via the grapevine that IC has moved to Kingston, Ont. CI is now fiddling with a.s.b. OR's yearly trek to Cape Breton, N.S., has been delayed by a disc operation. DX man IJ has been QRT fixing the shack and antennas and will be back on in earnest with a new Viking Thunderbolt. ALZ is moving into a new house at Pointe Claire. WT, manager of QQN, reports another busy month with 24 sessions, 195 stations reporting and 104 messages handled. BE is on a Maritime and Maine jaunt with his XYL. The Burlington ham gathering was well attended by VE2s. We would appreciate more news from outlying districts. Traffic: (June) VE2WT 65, DR 53, AGM 27, BG 15, EC 14. (May) W7QMU/VE8 80.

ALBERTA—SCM. Harry Harrold, VE6TG—SEC: FS, PAM: PV, OES: DB. As your new SCM I hope that I may be of service to any of you, so call on me any time. There are a number of appointments open and I would like to see some of you qualify and accept some of the different ones, as they will help you in amateur radio and will help to bring up our membership in ARRL for the Alberta section. As all activity for July and August drops off, I hope to see things start moving in September, so now is the time to get your appointments in. Let's get Alberta on the map and make it active. You will find my QTH on page 6 of QST. I hope to hear from the different clubs in the fall when they start activities again. So fellows, let's hear from you all. Anyone who holds an appointment certificate and wishes to continue is asked to please send it in for endorsement. Traffic: VE6HM 204, FS 35, SS 5, BA 3, YE 3, PV 2, TG 2.

BRITISH COLUMBIA—SCM. H. E. Savage, VET-FB—Field Day is now history and history was made by a week end of sunshine and a warm night with fifteen stations reporting to this office. SL is in the Shaughnessy Hospital completely paralyzed with little chance of recovery. JI is in General, Vancouver, for some time. AQH misjudged the flaming hoop on his motorcycle and ended up in the hospital. LP is back on again. HM is heard from Bridge River after years of silence. OM was awarded SNC for his activity on the BCAREC. JD is our new member to amateur radio. BGE and BFK have been awarded the Regional Net certificate, which makes them full members of the Seventh Regional Net (RN7). Thanks again to BHB, Eva, for being the only one to keep us informed of news for this column. We understand AGC has an 83 linear amplifier. BFN works good DX on 15 meters. ST's QTH is Victoria. AS has been appointed Radio Coordinator for the Vancouver Target Area of c.d. AGK is net manager of the Northern Net. BCAREC Net report: Sessions 26, check-ins 1122, messages 253. Traffic: VE7BDP 82, AAF 74, BGE 40, BFK 38, BFL 16, AMW 13, JQ 12.

MANITOBA—SCM. M. S. Watson, VE4JY—The ARRL operated Field Day from the farm of WS at
 (Continued on page 134)

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Rosser with HL and IM, assisted by BF, being the chief operators. Using independent power and a Viking II they piled up a nice score on c.w. and a.m. The WARC operated near Richer with HE, RE, FO, MI and WOKLP, portable 4, being the chief attendants. The Bousjour Club was active under JW with 4 operators taking part. Bill had two independent power plants and two transmitters in operation. Your SCM had a message from DF, via NW at Flin Flon, where 8 operators were located at Big Island Lake. At the ARLM meeting SK, formerly VP4MM, gave an interesting talk on ham activity in Trinidad and adjacent islands. WJ was presented with the ARLM past president's Buffalo pin suitably engraved. Membership Buffalo pins are now available from the secy. Some of the Manitoba clubs joined in a successful exhibit at the Red River Exhibition. Owing to forest fires in the north RR, our PAM, has been off the air for some time attending his forestry duties. TT has now recovered from his spell in the hospital. The severe drought has curtailed the activities of our farmer hams who are busy hunting feed. Traffic: VE4JY 10, QD 10, AN 2, IW 1.

SASKATCHEWAN—SCM, Harold R. Horn, VE5HR—GI sent in a nice OES report. He has 16 states confirmed for 20 worked plus B.C. on 50 Mc. GG also is active on 50 Mc. Field Day was very successful throughout the section. The SARC ended up with a big outdoor supper for all participants and their families. The QC Club bowed to the SARC's superior efforts this year. The Saskatchewan Hamfest at Waskesiu Lake was a real success. New officers of the SARC are QC, pres.; JK, vice-pres.; HQ, secy. The President's Award was won by a non-amateur at Saskatoon. HQ won the award for furthering amateur radio in Saskatchewan the past year by his efforts toward QSO, official organ of the SARC, also for his traffic-handling activities. AX won the Gus Cox Memorial C.W. Trophy at 25 w.p.m. LQ won the CKBI Technical Trophy. PI won the furlined button-holes (liar's contest). The Fred Hammond Award for home-brew equipment was won by BV, for the best mobile equipment by BV first and UC second. The hidden transmitter hunt was won by QC, with FY second. Two new awards to aim at next year's hamfest in Saskatoon are an award open to all licensed amateurs for c.w. and an award to the best club for showing at FD events.

Armed Forces Results

(Continued from page 64)

The radioteletypewriter receiving competition featured a message from the Secretary of Defense transmitted at sixty words per minute. A total of 537 contestants submitted a perfect copy and have received their certificates. The award winners were:

N1AUU, W1BGW, W1BRJ, K1CLD, W1FGL, W1GPY, K1GRS, W1GWW, K1IZM, W1JRW, K1KFR, W1KQY, W1MCG, K1NAH, K1NKG, W1OUG, W1QPD, W1RMI, W1UHE, W1VSA

K2BRH, W2BWN, W2BXW, K2CXO, K2DDE, W2EEET, W2EKM, W2ELW, W2ELK, W2ESW, K2EWB, W2EXB, W2GOK, W2GON, W2ICA, K2IRW, W2IRW, W2JAV, K2KIE, W2KLD, K2KUC, K2LGS, K2MAV, K2MRQ, W2OKO, W2ORX, W2OZU, K2QJA, K2QMW, K2SDR, K2SFY, K2SKK, W2SKK, W2TFM, W2UAE, W2UNF, K2VAM, W2ZMK

W3BBV, W3BOI, W3CA, W3CRO, W3DFS, W3DJZ, W3WZA, K3GCI, W3GIY, W3GSO, W3HCE, W3ISE, W3ITV, K3IUV, W3JNE, K3KDY, W3MVA, W3MVA, W3NNV, W3NQA, W3OMX, W3PRQ, W3UCY, W3UDG, W3VAZ, AF3VHK, W3VU, W3VEA, W3ZVJ
W4AFN, W4AIV, W4AIV, W4AMY, W4AWY, W4BKJ, W4BOC, W4BSV, K4CFG, K4CUV, K4DBQ, W4DDQ, AA4DSI, AA4DWG, D4ADZ, W4FZY, W4GDE, K4GLD, W4HMN, W4IET, K4IFZ, W4IRZ, W4ISM, W4JUU, AA4MD, W4KFY, K4KKZ, W4KR, W4KZC, W4MGY,

(Continued on page 136)

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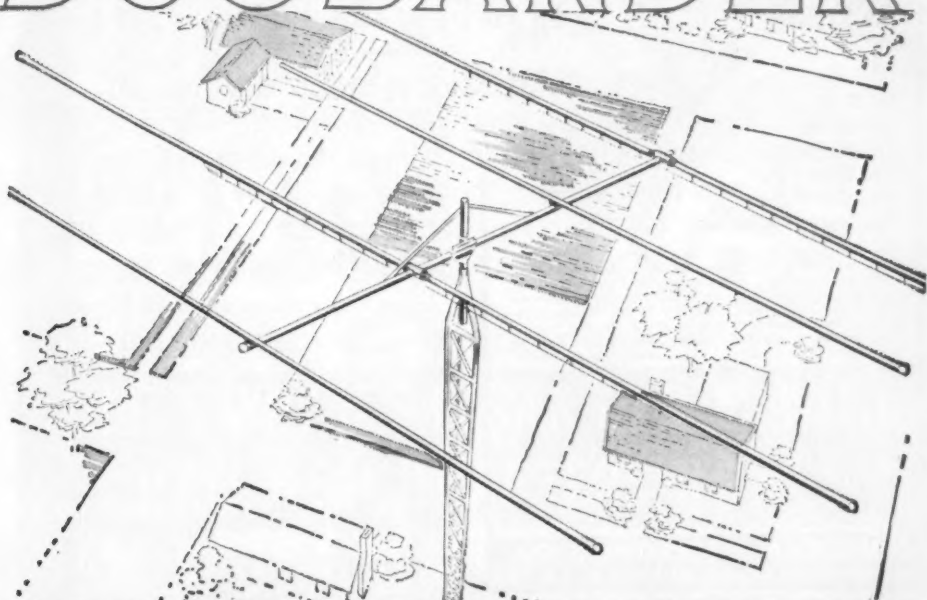
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Low sun spot activity and fewer band openings on 10 and 15 meters prompted the Hy-Gain engineering staff to design this important new antenna system for the very popular and very usable 20 and 40 meter amateur bands. The new Hy-Gain Duo-Bander consists of three full sized elements on 20 meters, and two reduced size elements on 40 meters in a relatively compact, light weight, highly practical antenna configuration.

Two-band operation is made possible through the use of an exclusive Hy-Gain development—the linear decoupling stub. This new advancement eliminates the use of inductance and capacity traps, yet decouples various sections of the Duo-Bander elements in an extremely efficient manner.

The linear decoupling stubs also perform a second function in reducing the overall length of the 40 meter element to approximately 2/3 normal size. Another Hy-Gain exclusive, the linear loading principle, far exceeds the efficiency of a loading coil in reducing antenna size.

A proven Hy-Gain development—THE BETA MATCH makes possible maximum gain and low standing wave ratio into a single 52 ohm coaxial feed line. For perfect pattern symmetry, a broad band balun is an integral part of the matching system.

The Hy-Gain Duo-Bander is available from Electronic Wholesalers \$149.50.

SPECIFICATIONS

ELECTRICAL

Forward Gain over a tuned dipole 20 meters	8.1 DB
Forward Gain over a tuned dipole 40 meters	4.9 DB
Front to back ratio 20 meters	20-30 DB
Front to back ratio 40 meters	15-20 DB
VSWR at resonance (typical)	1.2:1
Nominal impedance	50 ohms
Power Capability	5 KW P.E.P., 3 KW AM

MECHANICAL

Net Weight	54 lbs.
Boom Length	24 ft.
Element Length	Approx. 40 ft.
All aluminum construction	
Alloy 6063T832 — Tensile strength 45,000 PSI	
All hardware iridite treated to military specifications, all plastic high impact Cycloc	
Wind surface area	6.9 sq. ft.
Turning Radius	24.2 ft.



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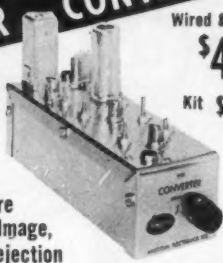
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220 MC Bands
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Spurious & IF Rejection

Wired & Tested
\$44.95
Kit **\$31.95**

The new deluxe "Cadillac" line of Ameco VHF Converters uses three RCA Nuvistors—two as RF amplifiers, the third as the mixer. This combination produces an extremely low noise figure, high gain; high image, spurious and IF rejection. These converters do not become obsolete as the output frequency is easily changed when a new receiver is acquired. The CN Converters are built on a compact (2"x2½"x6¾") satin finished copper chassis. A gain control is included. Power requirements: 100 to 300V. at 30 ma. and 6.3V. at 1A. The Ameco PS-1 Power Supply is ideal, available in Kit form (PS-1K) at \$10.50 or Wired and Tested (PS-1W) at \$11.50.

Model CN-50W, CN-144W, CN-220W Nuvistor Converter, wired and tested for any one band (specify IF output). **\$44.95**

Model CN-50K, CN-144K, CN-220K Nuvistor Converter, in kit form, for any one band (specify IF output) **\$31.95**

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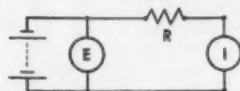
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analogy #3: a problem in Ohm's law

$$R = \frac{E}{I}$$



Problem:

If E is 11.38961 volts, and current (I) is 5 microamps, what is the value of R?

The answer to this problem is also the best answer to any problem you may have concerning your ham equipment. For, by just dialing it (If long distance, dial 212 first) you are soon talking with one of our friendly ham specialists, well qualified to help you get the most performance and pleasure from your gear.

73, *Bill Harrison*, W2AVA

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It's really hot! Ten active tubes—triple conversion, crystal controlled input—can also cover MARS, CAP, etc.—faster AVC, for CW break-in—product and diode detection—frequency stabilized—plus many other most desired features.

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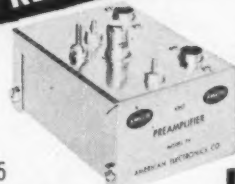
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Lowest Noise
22 DB Gain

\$13.95



wired and tested

Add an Ameco Nuvistor Preamplifier to your converter or receiver to improve the noise figure and gain. Image and spurious rejection will also be improved as the Model PV has two tuned circuits. Compact, easily connected, low power requirements.

Model PV with tube, wired and tested.

State which band **\$13.95**

For any band, 80, 40, 20, 15 or 10 meters, the Ameco Model PH Preamplifier has a better noise figure than most multiband receivers, 23 db. minimum gain, will improve image and spurious rejection with its two tuned circuits. Especially effective on 10 or 15 meters. Model PH with tube, wired and tested.

State which band **\$13.95**

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Correspondence from Members

(Continued from page 77)

logical unit and is in widespread use. There is no reason why the Handbook, the License Manual, and QST should not also use it. — Donald Chester, K4KYV, Woodlawn, Tennessee.

SPACE SAVER

¶ I can't understand why you encourage RTTY. One such station takes up the space in which many c.w. stations could operate. And again the RTTY stations are operating about 14,090 kc. Everybody worries about the phones but I have heard little about helping out the c.w. mess in the 14-Mc. band. So now we add RTTY in the c.w. segment. Why? — Edward D. Wells, W8EW, East Grand Rapids, Michigan.

HELPING HAND

¶ It has been about six months since I became interested in amateur radio. I enthusiastically dove in head first; accumulating equipment—ready made, kit and homebrew—spurred on by the editorial reminders in ham publications of the "camaderie" and "esprit-de-corps" of the amateur radio fraternity. I can succinctly sum up my opinion of this "buddy-buddy" relationship in one word—Baloney!

Having subsequently received my Novice ticket, I discovered that my equipment was not functioning as efficiently as it should. I had only four contacts to show for two months of operation. One of these happened to be a General Class operator who resided about a quarter mile from my QTH. It was a c.w. to phone contact. He expressed amazement at the limited number of contacts I had made. He suggested that he visit me and check my equipment and arrangements were made for him to visit me the next day. He never showed. Aware of my need for assistance from someone with a great deal more technical competence than I possessed, I wrote the president of the local radio club requesting at his convenience, someone from his organization to contact me. No answer. I wrote the secretary. Same story. I am seriously considering throwing in the sponge and taking up stamp collecting.

I read as much and as often as I can from magazines, text-books etc. concerning amateur radio. I devote on an average three to four hours each night to checking, rechecking, and adjusting my rig and I am frustrated. I need help but I don't believe I am going to get it from the hams I have come into contact with. — Eugene Bosinski, WV2SMW, Jersey City, N. J.

QST

Strays

Work three members of the Porterville (Calif.) ARC during 1961 and receive a special Porterville Centennial certificate. Send QSLs to Porterville ARC, 601 North Main St., Porterville, Calif.

Win the COBRA Award by working 25 stations in the metropolitan Baltimore area, at least 10 of these to be members of the City of Baltimore Radio Ass'n. (DX stations work 15, 7 to be Ass'n members.) All QSOs to be after May 1, 1961. Send QSLs and 50¢ fee to Louis C. Bremer, W3LE, 7704 Old Harford Rd., Baltimore County 14, Md.

World Above 50 Mc.

(Continued from page 67)

of Texas officials. During these two exhibits, the club had equipment set up and operating as well as officials present to explain amateur radio and its duties, purposes, etc. This year the date has been set as October 8, 1961, and the day has been designated as "V.H.F. Amateur Radio Day". Location will be the Special Events Theater Building on the State Fair grounds. Equipment to be used: 1. a.f.a.k. teletype, operating on 50 Mc. only. 2. 6-Meter f.m. system operating 52.950 Mc. only, with a carrier of 100 watts. 3. A 250-watt input 4CX250B homebrew, a.m. transmitter. Receiving and transmitting frequencies will be on 50.150 to 50.70 Mc.

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HT-40 TRANSMITTER KIT

- 75 Watt Input!
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- Full Band Switching!
- Easy Tuning! Modern Styling!

Incomparable quality and ease of assembly make this kit the leader in the amateur field! Filled with features important to the old-timers as well as to novices!

***SPECIFICATIONS:** Max. D.C. power input: 75 watts. Output over 35 watts CW, 30 watts peak AM phone. Freq. bands: 80, 40, 20, 15, 10 and 6 meters.

***FRONT PANEL:** Function Switch (AC off, tune, standby, AM, CW); Band Selector; Drive Control; Plate tuning, plate loading; Crystal V.F.O.; Grid Current Meter; AC Indicator Light; RF Output.

***REAR CHASSIS:** Mic. gain; antenna coax connector; remote control terminals, AC power cord.

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- Top Sensitivity & Selectivity!
- Built-In S-Meter with Adjust!
- Easiest Assembly!

Combines top quality and performance with built-in extras. The SX-140 is the lowest priced amateur band receiver available!

***FEATURES:** RF stage, S-Meter antenna trimmer and XTAL calibrator. Complete band coverage: 80-6 meters. Tuning ratio: 25 to 1.

***CONTROLS:** Tuning; Antenna Trimmer; Cal. Reset; Function (AC off, Standby, AM, CW-SSB); Band Selector; Cal.; RF Gain; Auto Noise Limiter; Selectivity/BFO; Audio Gain; Phone Jack; S-Meter Adjust.

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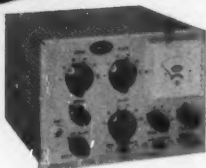
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**CW and Phone
Mobile or Fixed
6146 Final, Straight
thru on all bands.**



The AMECO TX-86 can handle 90 watts input on CW and 90 watts peak input on phone on all bands. It is extremely compact (5" x 7" x 7") and attractively packaged in a satin finished copper panel and a black perforated cabinet. Tube lineup is—a 12BY7 oscillator, a 6BQ5 buffer and a 6146 final, modulated by a 12AX7 and a 6AQ5 in an improved low distortion type of screen modulator which cannot be distinguished from plate modulation by ear, S meter, oscilloscope or panadapter. It is NOT controlled carrier modulation; it is NOT clamp tube modulation. Other features include push-to-talk mike jack, audio gain control, potentiometer drive control (no detuning of circuits), TVI suppression, crystal control or external VFO.

Power required for maximum output—6 or 12 volts for filaments, 300 V. at 75 ma. and 600 V. at 150 ma. Will also work with reduced output and with no changes from a 300 V. supply.

NET PRICES: Model TX-86K, complete in kit form, \$84.95
Model TX-86W, completely wired and tested.....\$109.95

AC Power Supply for TX-86, to provide full output power, Model PS-3, wired and tested\$44.95

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A new club started in the tri-state area consisting of Illinois, Indiana and Kentucky, is known as "S.M.A.R.T." (Six Meter Amateur Radio Technicians). This group offers a certificate for working five of their members on six meters after May 1, 1961. Submit list only to K9TNR, who will check it from local logs and your QSL's. No charge.

On June 9, 1961, twenty-five amateurs attended a meeting at Lovelace Radiation Therapy Lab, where Ed Tilton, W1HDQ, V.H.F. Editor of QST, was the speaker. In addition to answering questions on ARRL policy, Ed described the v.h.f. equipment being featured as a four-part article in QST. Ed also participated in the v.h.f. contest from a New Mexico mountain top.

The Amateur Radio Technical Society of St. Louis is attempting to get more activity in the St. Louis area on the 220-Mc. band, which at present has no known active stations other than a rag chew at 2200 local time on Mondays near 222.4 using 10- to 20-watt transmitters. Look for KBABK, K0HZZW and W0IFC.

The Two Meter XYL Net continues successful in Florida with five members checking in regularly: W4USG, K4PPX, K4RCX, K4RBG and W4BMC are the members to look for sez Bertha, W4BMC.

The "Sandia Base Friendship Award" is now offered to those v.h.f.ers who work five Albuquerque stations on 50 Mc. or higher. List of contacts; date, time, call, name, etc., should be sent to John C. Kanode, K3UYF, 408½ Cornell Drive S.E., Albuquerque, New Mexico. \$1 certificate went to W9YZZ in Overland Park, Kansas.

220 Mc. and Up

W7IST reports the 220-Mc. path for Eatonville, Washington to Portland, Oregon is very much like 432 Mc. Allen is still looking for 220-Mc. schedules. W1AJR reports two good coastal openings on 432 Mc. from Newport, Rhode Island to Hampton, Virginia, on June 5 and June 18. Good solid contacts with W4VVE over the 410-mile path were enjoyed. Naturally nobody else was on. 1296-Mc. enthusiasts will be happy to learn that the UPX-4 transmitter receiver (ground station for the APX-6) is now hitting the surplus market. This little gem is crystal control on both receiver and transmitter. Transmitter uses 6 (six) 2C39As in a ring amplifier driven by a bank of 3-2C39As in cascade which are in turn driven by a 2C39A tripler. So far I have managed to squeeze 300 watts out of the amplifier with 600 watts input.

W8PT monitors 220 Mc. during auroral sessions — so far no signals heard. Anyone interested in 220-Mc. aurora please arrange schedules with W8PT. Jack is working on a new rig for 220 Mc. but has stalled on the final as not enough interest in long-haul work. A nightly schedule with W9AAG is proving very effective. This 225-mile schedule on 432 Mc. keeps interest up for W0OII, W9OJI, W9BTI, W9GDP, W9ZIH and K9AAJ, who participate as the spirit moves. In the Michigan, Indiana, Illinois and Ohio area, we find W8GOV, W8CVQ, W8EYD, W8KSZ, K8JZR, W9REM, W9OVL, W9JEC, K9ILH, W9RPF and K9JLJ, keeping the 220-Mc. band active. (Sure wish you 432 and 220 Mc. boys would send in your operating frequencies.) W4TLC (Taylor, South Carolina) and K4KLD (Hoschton, Georgia) are keeping morning schedules on 220 Mc. K4TLC is on 220.2 and Jay (K4KLD) is on 220.050. Schedules are at 1200 GMT and other schedules are invited. K2UUR continues active on 1296; most contacts are with W6NTW/2. Rich is looking for skeds. K4EUS has a new 54-element 432-Mc. beam up and hopes to give W4VVE some 432-Mc. support. The reports from Ohio have W8LIO working on his 1296-Mc. transmitter. Jack has completed his antenna drive system so he can track the moon and plans to be operational in early September. Red, W8CAZ, has his five-foot polar-mounted parabola in operation. (See photo.) Receiver uses paramp mounted at the focal point and feeding wide band receiving system. Plans for a narrow-band receiver are in the making.

Late report: W9ADM is running high-power c.w. on 50.015 Mc. at Ellsworth Station, Antarctica.

QST

OSCAR Radiograms

(Continued from page 19)

What Nets?

Since almost every net handling traffic in the United States handles traffic going to areas out-

(Continued on page 142)

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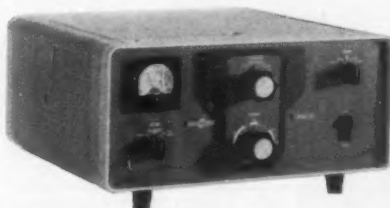
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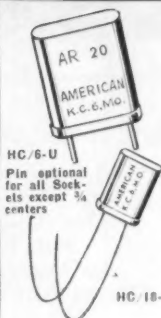
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The DKC-RFB Booster is a 50 to 70 ohm impedance matching "broadband pre-amplifier" guaranteed to increase the over-all gain by 1 to 6 dB units on all bands (1.5 to 30 mc.). To improve sensitivity, work with DX, and bring up weak unintelligible signals, you'll want a DKC-RFB. Designed for receivers up to the \$300 class.

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side of its own coverage, just about any traffic net can be used to handle the OSCAR traffic. For the most part, the ARRL National Traffic System will be the main traffic link for OSCAR messages. Thus your local section net, either phone or c.w., or any local net which ties into the NTS, will be able to handle the OSCAR traffic.

At the California end of the system will be two groups of traffic men to take the traffic. One group will handle any traffic which comes into the phone nets in California by having a liaison station check into these nets each day or evening of the 21 days of each satellite communications period. These stations will pick up the traffic and either deliver it on a single channel or in person. The second group of operators will be NTS men who will go into the Pacific Area Net and the Sixth Region Net to pick up traffic which has come across country and from the California area. It is hoped that the region net managers will help with the handling of this traffic by taking all OSCAR traffic from the section nets and nets which liaison to the region net. If there is a great deal of traffic, perhaps secondary channels will also have to be used.

MARS channels may also be used to pass the OSCAR tracking reports and stations operating on Army and Air Force MARS nets have been set up in the Sunnyvale area to handle the incoming traffic on these channels. Messages filed on the MARS nets should be in the standard military message form of course, but the text can be the same as that used on the amateur channels. If the OSCAR traffic is refiled from MARS to amateur nets along the line, the message heading should be changed to the amateur form.

Stations operating on RTTY can also send information via the existing RTTY nets, or on the frequencies most used by the RTTY gang. Several stations in the South San Francisco Bay area will be able to either relay your traffic or give to the OSCAR group direct.

OSCAR Launch Advisories

When the OSCAR communications group receives word that the satellite is in orbit and working, an OSCARGRAM will be sent to WIAW via RTTY and c.w. links which have been set up for this purpose. The OSCARGRAM will also be sent on all nets that can be covered, and stations on these nets will be asked to relay to other nets. Tracking data will be sent to WIAW as received to keep the amateurs up with the latest information. WIAW schedules can be found in QST under "Operating News" and amateurs interested in OSCAR should attempt to copy regular bulletins either on phone or c.w. on one or more channels some time before OSCAR, so as to be prepared to get the latest information. Regular Official Bulletin Stations across the country who copy the WIAW bulletins will also relay this information on their regular schedules.

In Conclusion

V.h.f. amateurs and experimenters who are not

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New! LAFAYETTE HE-50 10 METER AMATEUR TRANSCEIVER



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A significant step forward in 10-meter communications. The Lafayette HE-50 transceiver sets new standards of flexibility and performance in the 10-meter band.

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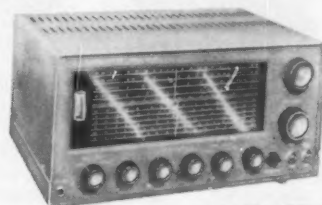


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144

familiar with traffic procedures and traffic nets should check with their SCM (see page 6, this issue) to find out when and where their section net meets or check with a local traffic operator for information on where and when to file messages. If you work with a net which does not normally have liaison to areas outside your area of coverage, ask the net manager to check into the possibility of assigning a station to take this traffic and handle it via the region net or some other net with liaison contacts.

Here is a chance for traffic men to show how well amateurs can handle traffic of such a perishable nature. It is also an opportunity for v.h.f. men and experimenters to make contact with the traffic outlets for future situations where such service may be needed.

QST

Happenings of the Month

(Continued from page 70)

may, of course, continue to use the 7-, 50- and 144-Mc. bands as well. The text of FCC's Report and Order in Docket 14026 appears below:

Before the FEDERAL COMMUNICATIONS COMMISSION Washington 25, D. C.

In the Matter of
Amendment of Section 12.90(b)(2)
of the Commission's Rules to permit
Maritime Mobile operation on a
World-Wide Basis in the 14.00-
14.35 Mc Band.

DOCKET NO. 14026
(RM-211)

REPORT AND ORDER

By the Commission: Commissioner Ford absent.

1. On April 3, 1961, the Commission released a Notice of Proposed Rule Making in the above-entitled matter seeking comments in favor of, or in opposition to, an amendment to Section 12.90(b)(2) of its Rules to permit maritime mobile operations in the frequency band 14.00-14.35 Mc on a world-wide basis. This Notice was duly published in the Federal Register, April 6, 1961 (26 FR 2876), and all timely comments filed in response thereto have been considered by the Commission.

2. Comments were received both from organizations and individuals, all unanimously favoring the proposed rule amendment. By adopting this change, amateurs licensed by the Commission who are operating beyond the continental limits of the United States, its territories and possessions will be on a somewhat more equal footing in terms of privileges with amateurs operating within these areas. In light of the absence of opposition and for the reasons which were set forth in detail in the Notice of Proposed Rule Making, the Commission sees no reason why the proposed rule amendment should not be adopted.

3. Authority for the amendment set forth in the attached Appendix is contained in Section 4(i) and 303 of the Communications Act of 1934, as amended.

Therefore, IT IS ORDERED, This 12th day of July, 1961, that Section 12.90(b)(2) of Part 12 of the Commission's Rules is amended as set forth in the Appendix attached hereto, effective August 21, 1961.

FEDERAL COMMUNICATIONS COMMISSION
BEN F. WAPLE
Acting Secretary

Attachment:

Appendix

Released: July 13, 1961

NOTE: Rules change herein will be covered by T. S. VI-9.

APPENDIX

Part 12 of the Commission's Rules is amended as follows:
(Continued on page 146)

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52232, 52302-09; FT-241A; MBF(COL-43065);
MD-7/ARC-5; R-9/APN-4; R23-R28/ARC-5;
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In § 12.90(b), the introductory text and subparagraph
(2) are amended to read as follows:

§ 12.90 Requirements for portable and mobile operation.

(b) When outside the continental limits of the United
States, its territories, or possessions, an amateur radio
station may be operated as portable or mobile only under
the following conditions:

(2) When outside the jurisdiction of a foreign govern-
ment: Operation may be conducted within Region 2 on any
amateur frequency band between 7.0 Mc and 148 Mc, in-
clusive; and when not within Region 2, operation may be
conducted only on the amateur frequency bands 14.00-
14.35 Mc, 21.00-21.45 Mc, and 28.0-29.7 Mc.

NOTE: Region 2 is defined as follows: On the east, a line
(B) extending from the North Pole along meridian 10° west
of Greenwich to its intersection with parallel 72° north;
thence by Great Circle Arc to the intersection of meridian
30° west and parallel 40° north; thence by Great Circle Arc
to the intersection of meridian 20° west and parallel 10°
south; thence along meridian 20° west to the South Pole.
On the west, a line (C) extending from the North Pole by
Great Circle Arc to the intersection of parallel 65° 30' north
with the international boundary in Bering Strait; thence
by Great Circle Arc to the intersection of meridian 165° east
of Greenwich and parallel 50° north; thence by Great Circle
Arc to the intersection of meridian 170° west and parallel
10° north; thence along parallel 10° north to its intersection
with meridian 120° west; thence along meridian 120° west
to the South Pole.

MINUTES OF EXECUTIVE COMMITTEE MEETING

No. 281

July 21, 1961

Pursuant to due notice, the Executive Committee of The
American Radio Relay League, Inc., met at the Headquar-
ters office of the League in West Hartford, Connecticut, at
10 a.m. July 21, 1961. Present: President Goodwin L. Dos-
land, in the Chair; First Vice-President, W. M. Groves;
General Manager John Huntton; Directors R. W. Denniston,
John G. Doyle, Morton B. Kahn and Raymond E.
Meyers; Vice President F. E. Handy and Treasurer David H.
Houghton.

On motion of Mr. Denniston, unanimously VOTED that,
in furtherance of the Board's action in minute (32) of the
1961 annual meeting, the General Manager is hereby author-
ized to reimburse QSL Managers, in lieu of travel to a divi-
sion convention, for travel to a meeting other than a division
convention, and to a location outside the call area, when in
the opinion of the General Manager the purposes of the
Board's action would be appropriately served.

On motion of Mr. Doyle, unanimously VOTED that the
League approves IARU proposal #90, which expresses the
view that the number of awards and certificates at present
in circulation are not in the best interest of amateur radio,
and provides for the preparation of a list of awards in good
standing which could bear the official approval of IARU.

On motion of Mr. Meyers, unanimously VOTED that the
Committee ratifies its mail action in approving the hold-
ing of a Michigan State Convention in Grand Rapids on
April 13-14, 1962, and a Delta Division Convention in New
Orleans, Louisiana, on September 1-3, 1962.

On motion of Mr. Doyle, unanimously VOTED that the
General Manager is instructed to petition the Federal Com-
munications Commission for amendment in the Rules Gov-
erning Amateur Service to relax the logging requirements as
they apply to mobile operation.

On motion of Mr. Meyers, unanimously VOTED that
the matter of preparation of a manual for elected and ap-
pointed League officials be laid on the table.

On motion of Mr. Denniston, affiliation was unanimously
GRANTED to the following societies:

Barrington High School Radio Club, Barrington, R. I.
Boeing Employees Amateur Radio
Society.....Seattle, Washington
Central Nebraska Amateur Radio
Club.....Broken Bow, Nebraska
Cherry Point Amateur Radio Club.....Cherry Point, N. C.
Hicksville High School Amateur Ra-
dio Club.....Hicksville, New York

(Continued on page 148)

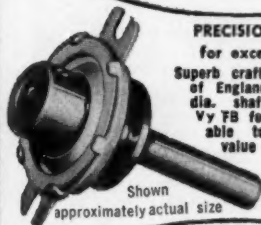
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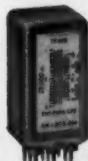
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For use with Mod. 261 Coupler.
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of SWR or relative RF power.

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Mod. 690 RF LOAD RESISTOR
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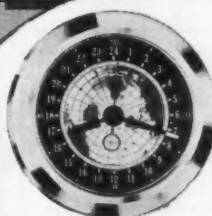
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24 hr. chrome plated 8" metal wall clock. Inner dial with south polar projection map of world indicates time around world. Polar projection dial adjustable for various time zones. Shpg. wt. 2 lbs.

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FOR 50, 144 or 220 mc.
Over 20 db gain plus a low noise figure. 2 tuned ckts, 6CW4 Nuvistor completely neutralized. Noise figure is 2.5 db @ 50 mc, 3.8 db @ 144 mc and 4.8 db @ 220 mc. Power requirements: 100-150 v. @ 8 ma, and 6.3 v. at .13 amps. Specify frequency desired.

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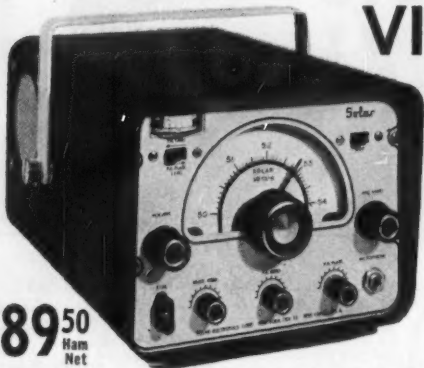
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before

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MGC (HS) Scout Units #61 Amateur
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New Trier Radio Club (High School) Winnetka, Ill.
Nipmuc Emergency Radio Corps..... Upton, Mass.
Northwest Amateur Radio Commu-
nications System, Inc..... Olympia, Wash.
Nortronics Amateur Radio Club..... Norwood, Mass.
Oak Hill School Amateur Radio
Club..... Hartford, Conn.
OH-KY-IN V.H.F. Radio Society..... Cincinnati, Ohio
Pasadena Radio Club..... Altadena, California
River Park Amateur Radio Club,
Inc..... Chicago, Ill.
The Salvation Army Disaster Com-
munications Net (Club)..... Los Angeles, California
The 6220 VHF Radio Club of New
Jersey..... Wayne, N. J.
Tioga Radio Amateur Club, Inc..... Monticello, Indiana
Westbrook Amateur Radio Club..... Westbrook, Maine
On motion of Mr. Doyle, unanimously VOTED that the
directors and affiliated clubs be furnished a supply of mem-
bership application blanks in pad form.

During the course of the meeting, without formal action
the Committee discussed the proposed new headquarters
building, ARRL legal counsel, amateur license fees, a v.h.f.
handbook, the 420-Mc. power limit, handling of articles for
QST, and the monthly QST article awards.

There being no further business, the Committee there-
upon adjourned at 12:55 P.M.

QST

June VHF Party Results

(Continued from page 30)

WA2KMF/2 (10 ops.)
1859-143-13-AB
K2ODL (K2ODL, WA2CJL,
WV2PFQ)
1344- 64-21-AB
W2ELJ/2 (K2s QXU ZBU)
1278- 71-18-AB
K2TXO/2 (5 ops.)
1156- 68-17-A
K2BPV (K2BPV, WA2CIG)
629- 37-17-A
Western Pennsylvania
W3RUE 6615-143-45-ABC
K3CHC 2691-117-23-AB
W3UMY 1449- 63-23-AB
W3DJM 287- 41- 7-A
W3FUH 144- 19- 6-B
W3UHN 144- 18- 8-A
K3BBO/3 (K3s BBO LKS
PHD) 7434-177-42-AB
K3RKK (11 ops.)
3584-128-28-AB
W3QZF/3 (4 ops.)
990- 55-18-A

CENTRAL DIVISION

Illinois

K9HDE 9266-226-41-AB
K9BDI 3780-105-36-A
K9DTH 3638-107-34-AB
K9YHI 2622-114-23-A
K9VYD 1633- 71-23-AB
K9GRH 1408- 64-22-A
W9EJ 1220- 61-20-AB
K9RYG 770-119- 7-AB
K9UHC 608- 32-19-A
W9CEJ 328- 82- 4-AB
K9IUM 350- 25-14-A
K9AAJ 261- 28- 9-BD
K9BBN² 159- 53- 3-B
K9CNF 147- 49- 3-B
K9GZF 138- 46- 3-B
W9BSM 112- 28- 4-AB
W9OTW 88- 22- 4-B
K9AWS 86- 43- 2-B
K9OBI 82- 41- 2-B
W9VPU 80- 20- 4-B
K9AWN 44- 11- 4-A
W9AXT 40- 10- 4-B
K9NDE 26- 12- 2-B
W9KBP 21- 7- 3-A
K9BGV 8- 8- 1-B
K9JXY (5 ops.)
7210-206-35-AB
W9BBF (5 ops.)
7106-184-38-ABC
K9HGX/9 (7 ops.)
1296- 72-18-AB
W9BGX (K9ZCK, K9PFC)
1007- 53-19-AB

Indiana

K9KFL 8680-217-40-AB
K9IXQ 2700-220-15-AB
K9QCB 7400-200-37-AB
K9HYV 2759- 89-31-AB
K9YTG 1760- 88-20-A

K9JJZ 1848- 65-28-A
K9PNP 560- 35-15-A
K9AQ 336- 56- 6-5
W9YDP 180- 20- 9-A
K9WQR 16- 8- 2-B
W9PMZ (5 ops.)
11-868-276-43-A
K9MMH/9 (K9s MMH MGS
SLQ) 10-038-230-42-AB
K9VPE (K9s VPE PED)
9711-249-39-AB
W9REG (K9s DQB LYA,
K5WFO)
8470-242-35-AB
K9VSA (K9s SJY PFQ QXN)
1892- 86-22-AB

Wisconsin

K9LBQ 13-024-296-44-A
K9WU 8772-204-43-AB
K9OXY 2904- 58-33-AB
W9JOT 1659- 70-21-AB
K9GSE 1100- 30-22-A
W9IXF 610- 51-10-ABC
W9TF 515- 37-14-AB
W9OVZ 30- 15- 2-B
K9MWQ 14- 7- 2-B
W9VFP (W9s AAZ VFP, W8-
LIM) 6405-183-35-AB
W9YU (K9s ANJ QYM, W9-
SZR) 6200-200-31-A

DAKOTA DIVISION

North Dakota

W9GNS 8388-233-36-A

South Dakota

K9UDZ 1164-199-36-A
W9ENC 2794- 96-29-AB
W9FJZ 78- 13- 6-A

Minnesota

K9GIQ 8736-224-39-AB

DELTA DIVISION

Arkansas

K5AZH 2100- 84-25-A
K5GOW 1426- 62-23-A

Louisiana

W5DNL 7920-176-45-A
W5UQR 7392-168-44-A
K5FLY 2106- 81-26-A
W5ESW 1624- 58-28-A
K9INF/5 578- 34-17-A
K5ZQX 510- 34-15-A

Mississippi

K5WJL 1475- 59-25-A

Tennessee

K4JWZ 1239- 59-21-A
W4JJK 1220- 61-20-AB
K4KTC 407- 37-11-A
K4SXK/4 180- 30- 6-A

(Continued on page 150)

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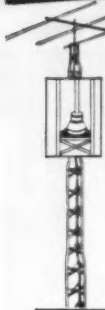
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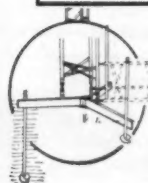
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Instruction

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Light Weight

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K4FSH/4¹ (K4s FSH FKO.
WN4BSJ)
3379-163-33-AB
K4WOE/4 (4 ops.)
2737-119-23-A
W4UDT/4 (W4s NUW UDT
K4QV)
2160-108-20-A
W4SKH/4 (5 ops.)
2024-88-23-AB

GREAT LAKES DIVISION

Kentucky

W4WYX 4290-143-30-A
W4GSH 4060-116-35-A
W4KLA 2407-83-29-A
K4RZK 1100-55-20-AB

Michigan

K8NIE 6396-156-41-AB
K8BGZ 5040-120-42-AB
W8NOH 3502-103-34-AB
K8LXU 2508-76-35-A
W8CVQ 1992-80-24-ABC
K8GKX 1580-79-20-A
K8WPK 1372-49-28-A
K8MRS 8147-72-22-A
W8ZGW 469-67-7-B
K8LHL 425-85-5-B
W8VXI 188-47-4-B
K8MPT 150-60-6-B
W8VRH 120-40-3-B
K8IVW 26-13-2-AB
K8LXF 26-13-2-AB
K8SBN 3-3-1-A
K8NOS/8 (5 ops.)
7068-249-32-AB

Ohio

K8SSK 6401-173-37-A
W8KCF 2725-109-25-A
W8SGX 1958-80-22-A
K8TQA 1305-87-15-A
K8MXN 1245-83-15-A
K8PML 310-31-10-A
K8PBE 171-19-9-A
W8KJM 95-19-5-A
K8NWT 56-28-2-B
K8RUW 8-8-1-A
W8LNF 6-3-2-A
K8LEP/8 (4 ops.)
16,882-361-46-AB
K8BLS/8 (10 ops.)
15,488-352-44-AB
K8PIY (K8s PIY NYM)
7100-237-30-A
W8CWL/8 (7 ops.)
2236-172-13-AB

HUDSON DIVISION

Eastern New York

W2BAH/2 13,700-274-50-AB
K2YHL 9048-232-39-A
W2IMG 1180-59-20-AB
W2HQA 632-38-14-AB
K2JF 70-17-4-BC
W2S2P 66-22-3-B
W2ANYM 28-14-2-B
W2AETQ 4-2-B
W2LW/2 (4 ops.)
34,320-462-66-ABCDE
K2BGU/2 (7 ops.)
14,300-306-46-ABC
K2CQG (8 ops.)
784-53-14-ABCD
K2VYN (K2VYN, W2LY)
210-21-10-AB

N.Y.C.-L.I.

K2HLA 9982-217-46-AB
W2FBA 3430-98-35-AB
K2IEJ/2 3008-188-16-B
W2IKR 3000-120-25-AB
K2PQY 1680-70-24-AB
K2UTN 1260-68-18-AE
W2KLN 1250-125-10-B
W2EXL 1100-55-20-A
W2ZFO 780-78-10-B
W2GLU 774-86-9-B
W2TUK 648-54-12-AB
W2DRK 319-29-11-B
W2ZBH 165-35-5-B
W2AUF 105-15-7-B
K2ZYH 6-3-2-A
W2ZSU 6-1-1-B
K2MTT/1 (K2s MT, UMN
W2PSO)
5684-203-28-A
W2ADWL (W2s DWL KH W
4176-144-29-AB
K2RTH (K2s RTH RCH)
1652-118-14-B
W2RED (W2RED, K2VUH)
338-26-13-AB
W2AHGJ (W2s HGJ QWO)
2-2-1-A

Northern New Jersey

W2GKR 5643-171-33-AB
W2HFI 3596-124-29-AB
K2IDP 3562-137-26-AB

K2LNS 3240-216-15-B
W2IYW 2938-113-26-AB
K2HFL 274-96-6-AB
W2DZA 1365-52-21-ABCD
W2JTM 1332-74-18-AB
W2BDP 1281-61-21-A
W2GBY 1045-95-11-B
K2ICE 740-74-10-B
W2SEI 510-85-6-B
W2JWM 216-36-6-AB
K2PTD/2 160-20-8-A
W2NMX 60-12-5-B
W2XU 53-26-2-B
W2FEZ/2 (10 ops.)
49,728-630-74-ABCDE
W2QCR/2 (11 ops.)
19,080-360-53-AB
W2ZDR (8 ops.)
19,080-424-45-AB
K2BJP/2 (5 ops.)
14,924-339-41-ABCD
W2AF/2 (7 ops.)
8145-181-45-AB
W2OR/2 (12 ops.)
7575-303-25-AB
K2YNT/2 (5 ops.)
3150-160-21-AB
W2JU/2 (M2s JUM operator)
2641-139-19-AB
K2BEV/2 (5 ops.)
1833-141-13-AB
K2LSA (10 ops.)
1090-109-10-B
W2CCF (W2s CCF LNA
MWU) 72-18-4-AB

MIDWEST DIVISION

Iowa

W0AXU 14,758-214-47-AB
W0WKB 9548-217-44-A
K0KPF 9120-228-40-AB
W0PFB 3716-106-35-A
K0RBP 3192-114-35-A
K0CER 2300-92-25-A
K0HPK 448-28-16-A
K0SNW 425-25-11-A
K0PCE 266-23-12-A

Kansas

K0TTF 14,612-281-52-ABC
K0REE 13,800-300-46-AB
W0YMG 9405-205-45-ABE
W0NGL 6768-188-36-AB
K0ZUY 4470-149-30-A
W0WVQ 3990-110-34-ABE
K0VHP 3720-120-31-AB
K0GTK 3000-100-30-A
K0IPB 2368-74-32-AB
W0JAS 2240-64-35-AB
K0GIC 1050-50-21-AB
K0CIA 363-33-11-AB
K0RWC 170-17-10-A
K0RL 64-16-4-B

Missouri

K0LCB 10,906-287-38-A
W0KMY 7486-197-38-AB
W0WEQ 5940-180-33-A
K0JNH 1584-16-24-AB
W0LFE 130-27-6-B
K0VVR/0 (K0s VVR UJM)
1024-64-16-AB

Nebraska

W0EET/0 3440-236-40-A
K0WIF 4572-127-36-A
K0SBB 4032-112-36-AB
K0ETA 1500-60-25-A
W0WRT 68-17-4-AB

NEW ENGLAND DIVISION

Connecticut

W1RJA 6888-168-41-AB
W1LYT/1 4061-131-31-A
K1CRC 3688-228-16-B
K1JFY 3444-123-28-A
W1WHL 2875-115-25-AB
K1DPA 12033-107-19-AB
K1CMA 1330-95-14-B
K1PFO/1 1144-104-11-B
W1RVP 1092-91-12-B
W1MPT 918-22-16-BCD
K1GCG 549-61-8-B
K1LNL 456-57-8-B
K1MNY 432-36-12-A
K1GZ 406-58-7-B
W1RFJ 300-60-5-AB
K1MNX 204-51-4-B
K1IUY 182-26-7-AB
K1NRL 12-22-6-B
K1GWD 70-14-5-B
W1HAX 48-24-2-B
K1EY 32-22-6-B
K1QOZ 22-11-2-A
W1QED/1 16-8-2-B
K1NSH 8-8-1-B
W1WV (W1WPR, K1LVW,
W5CGW)
2712-113-24-AB

(Continued on page 152)



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	Per Each	Dozen			
1000 ft. Asst. Size Push Back			Hand crank GN45C Generators,		
—H.U. wire.....	\$2.95		can be converted to 12 V.A.C.		
4 Prong-Top Mount—H.D.			Drive.....	\$ 5.95	
Tube Sockets.....	.10	.95	24 VDC motor driven generator to		
3 Prong plug and 2 wire 8 ft.			800 volts, 19 amps N.W.	19.95	
3 Prong plug and 2 wire 8 ft.			Receiving type tubes "Reliable"		
Dual 25K pots in tandem.....	.25	2.50	brand. Types such as 6BE6,		
75M #1 taper Mallory Z12			6BJ6, 6AB4, 6AU4, 6AU5, 65A,		
pot.....	.25	2.50	list types needed.....	.65	
Telechron 1 R.P.M. 250V-60			Israeli Hi-Fi tweeters.....	4.59	
cycle motors.....	.50	5.00	2 for	8.00	
GE Pyranol dual .1-7000			Demo. Cornell Dubilier HAM-M		
VDC Cond.....	1.00	9.95	rotor (New warranty).....	108.00	
SPST add a switch (Clara-			Millen 90831 Modulator (40 watts)		
stat SWA).....	.05	.50	rack mounted (one only).....	45.00	
140 ohm line cords.....	.25	2.50	Mobilcon H302 Power supplies (12		
2 1/2" dial cord drums.....	.03	.29	VDC to 350V—125 MA.....	19.95	
4" x 1" Bakelite coil form			Drake Q Multipliers (915 KC)....	19.95	
with single layer winding.....	.05	.49	Drake Q Multipliers (262 KC)....	19.95	
100 watt 45 ohm screw bare			Drake Q Multipliers (500 KC)....	19.95	
resistors.....	.10	.95	Tecraft model CC5-50 wired 6		
7" porcelain stand off insu-			mt. converter (14-18 MC IF)		
lators.....	.25	2.50	also (6-10 MC).....	29.95	
5" porcelain stand off insu-			Transcon—10 meter transmitter &		
lators.....	.20	1.95	converter (12V filaments) Reg.		
6" porcelain stand off insu-			\$99.50.....	49.95	
lators.....	.20	1.95	Akkord 8 transistor AM-FM-SW		
9" x 1" x 3/4" ceramic blocks			portable (Reg. \$129.50 list)....	79.95	
5 1/2" porcelain wire stand			Tecraft C3/26 Citizens Band con-		
offs.....	.10	.99	verter (Bdct. Band IF).....	24.95	
Assorted rotary switches....	.10	.99	Tecraft model P-1 Power supply		
.5 mfd—600 v (Dual) Paper			for CC5 converters.....	12.95	
Cond.....	.25	2.50	Harvey Wells APS90—AC power		
1 AMP—1000V Cartridge			supply.....	39.95	
tester.....	.05	.49	Harvey Wells VPS90—DC power		
4 screw terminal board.....	.05	.49	supply.....	54.95	
Metal in line Auto type fuse			Harvey Wells 555 Mobile spkr. in		
holders.....	.03	.29	cabinet.....	4.95	
2 1/2" Bakelite pointer knobs			Harvey Wells 576 Mobile spkr. in		
(Brown).....	.05	.49	cabinet.....	4.95	
Nail type wire stand off insu-			Complete Sonar 4 watt portable,		
lators.....	.02	.19	Mcirine two-way radio with bat-		
Assorted 4W pots.....	.10	.99	teries, antenna, etc.—(AS IS)		
Giant 4 pin xmt tube sockets			Reg. \$289.50.....	49.95	
Std. 4 pin xmt tube sockets			Surplus State Police receivers on		
Tandem 100 ohms 2 watt			motorcycle mount—fixed fre-		
W.W. Pots w/knob.....	.25	2.50	quency on 1600—1700 KC		
XOA National Tube sockets.....	.05	.49	AM—6 volts (AS IS) EXTRA		
PSR25 National padder cond.			SPECIAL.....	2.95	
PRC-3 National microtron coil			2 for	5.00	
forms.....	.02	.19			
Dual phone plugs (telephone					
type).....	.35	3.50			
5 prong battery plug w/					
Fahenstock clips.....	.10	.99			
Flat iron & toaster plug w/					
spring.....	.05	.49			
Bud 5 prong Bakelite panel					
mount-sockets 2 for.....	.15	.70			
2 mfd 1000 VDC pyranol.....	1.00	9.95			
.01 2000V Mica.....	1.00	9.95			
Clip type 8AG fuse holders.....	.05	.49			
.0001 800 VDC Mica.....	.25	2.50			
6 prong ceramic sockets.....	.10	.99			

Assorted carbon pots.....	.10	.99
Assorted ceramic insulators	.01	
and parts.....	.45	per 50
3AG fuse holders clip type.....	.05	.49
7 prong ceramic tube sock-		
ets.....	.10	.99
Bayonet base pilot lite sock-		
et w/leads.....	.05	.49
8 prong octal ceramic sock-		
ets.....	.10	.99
Ohmite Z-O chokes.....	.03	.32
National X59 feed thru.....	.05	.49
Assorted Mica capacitors.....	.05	.49
6 prong Amphenol mica filled		
plugs.....	.05	.49
4 prong ceramic tube sockets	.10	.99

BEAMS—NEW & USED

(AS INDICATED)		
Mosley V144GP (2 Mtr.) Used.....	\$17.50	
Mosley VPA20-2 (New).....	39.50	
5A-6M Taco (New).....	9.95	
10A-6M Taco (New).....	17.50	
BAG6M (Baluns-for-above).....	3.95	
Hy-Gain 152 MT3 (New).....	99.50	
Mosley TA31 Jr.....	16.95	
Mosley V3.....	19.95	
Mosley V3 Jr.....	15.95	
Mosley TA32.....	59.95	
Mosley TA32 Jr.....	42.95	
Mosley A320.....	66.95	
Mosley S153.....	42.50	
Mosley S103.....	37.50	
Cushcraft AGP15.....	11.95	
Cushcraft AGP10.....	10.95	
Cushcraft ATGP3.....	24.95	
Cushcraft A28A.....	21.95	
Mosley V-27GP (CB) New.....	29.95	
Hi-Lite 3E10F.....	49.50	
Hy-Gain 153G.....	29.50	
Hy-Gain 152MT2.....	49.50	
Hy-Gain 203G.....	49.95	
Hy-Gain 113G.....	39.95	
Tennalab 5L20RG.....	\$ 99.50	
(Regular price \$225.00)		
Mosley VPA1520 (new).....	109.50	
Mosley VPA1020 (new).....	99.50	
Telrex 3EL20mtr. (Used).....	49.50	
Telrex 3EL10 mtr. (Used).....	39.50	

TUBES—NEW—GUARANTEED

All individually boxed except where noted in bulk.			
	Reg.	Each	Dozen
6H6.....	\$3.50	\$1.05	\$11.50
6SJ7.....	3.75	1.15	12.65
6J7.....	4.55	1.25	13.75
45 (Bulk pack).....	2.05	.65	7.15
2A6 (Bulk pack).....	3.65	1.10	12.10
6A8G.....	5.80	1.75	19.25
6AE6G.....	2.05	.65	7.15
6S8GT (Bulk pack).....	2.75	.85	9.35
6C4 (Bulk pack).....	1.50	.45	4.95
6J6 (Bulk pack).....	2.35	.75	8.25

USED TEST EQUIPMENT

	Each
Simpson 485 Crosshatch generator.....	\$59.00
Rick 750 Do-All TV generator.....	39.00
Hickok 660 Color-Bar generator.....	149.00
Hickok 450 V.D.M.....	20.00
Precision CR30 C.R. tube checker.....	28.00
Anko 72 tube tester.....	54.00
Sylvania 140 tube tester.....	58.00
B&K 500 tube tester.....	59.00
Precision 620 tube tester.....	34.00
ITT V field strength meter with	
portable battery supply.....	62.00

Write Uncle Dave
W2APF
with your needs
and problems.

TRADE-INS ACCEPTED AND
FOREIGN TRADE SOLICITED
BANK FINANCING

TIME PAYMENTS

18 Months to pay, Life
insurance at no extra cost

UNCLE DAVE'S
RADIO SHACK

A SUBSIDIARY OF
FORT ORANGE RADIO
DISTRIBUTING CO.



EVANS OFFERS

COMPLETE SERVICE

- To HAMS - - By HAMS
(12 licensed employees)
- EQUIPMENT and COMPONENTS
(Ham - Electronic - Electrical)
- TRADE-INS
(on new or used units)
- TIME PAYMENTS
(flexible, financed ourselves)
- ENGINEERING DEPARTMENT
(backing all equipment sales)
- RECONDITIONED EQUIPMENT
largest inventory in the Northeast
- EXPERIENCE - - 26 years as:

"YOUR FRIENDLY SUPPLIER"

Evans RADIO

CA 5-3358 • ROUTE 3A • BOW JCT.
BOX 312 • CONCORD, N. H.



MODEL S-1

"Saturn 6" Antenna
2-pc. adjustable aluminum mast,
bracket, universal bumper feed.
No holes to drill. Co-ax feed line
not incl. Net. \$16.95

"SATURN 6" MOBILE

- ▶ Horizontally polarized
- ▶ Minimizes flutter and noise
- ▶ Adjusts to your frequency in
6 meter band
- ▶ Feeds with 50-ohm cable
- ▶ Fits standard mounts
- ▶ Ruggedly constructed
- ▶ Weighs under 2 lbs.

HI-PAR PRODUCTS CO. • Fitchburg, Mass.

AUTRONIC KEY AND KEYS

For Perfect, Faster CW

Send QSL or Postcard for full data



Fully transistorized,
digital circuitry keyer
eliminates erratic send-
ing. Precision-made key
will not walk, is fully
adjustable.

FREE TRIAL

ELECTROPHYSICS CORP.

2500 West Coast Hwy.
Newport Beach, Calif.

W1ORS¹ (9 ops.)
1634- 86-19- AB
W1JZA (W1s JZA PHT)
1012- 92-11-BC
K1HKZ (K1HKZ, W1BGT)
459- 51- 9-AB

Maine

K1CXX/L 5068-181-28-AB
K1NTC 510- 34-15-A
W1EHF/L (W1EHF, K1-
AIC) 2618-119-22-ABCD

Eastern Massachusetts

K1IZM 18,963-387-49-AB
K1QHO 4544-142-32-A
K1RTE 4077-151-27-AB
W1AQE/L 3540-118-30-AB
K1DIT 2688-70-32-ABCD
W1JSM 2160-104-20-AB
K1KKS 1615- 85-19-A
W1HIC 1106- 79-14-AB
W1OOP 1026- 34-19-ABCD
K1MNO 36- 9- 4-B
K1QOB 36- 12- 2-B
K1LWG 1- 1- 1-B
K1OOR/L (8 ops.)
25,002-463-54-ABC
W1HPJ/L (13 ops.)
17,368-319-52-ABCD
K1PRO (K1s PKO, GRP,
KNISCH) 4092-132-31-AB
W1GFX (4 ops.)
3096-129-24-A
K1OSG (K1s OSG MNS)
3013-131-23-AB
W1MX (K1RNM, K2YMZ)
2369-103-23-A
K1MXS/L (K1s MXS LKR)
418- 52- 9-AB

Western Massachusetts

K1DIT/L 147- 9- 7-ABCD
W1NBN/L (8 ops.)
67,473-77-81-ABCD
K1MXF/L (K1s MXF DIR)
68- 6- 4-DE
K1BZT/L (K1BZT, W1KXH)
18- 3- 3-ADE

New Hampshire

W1FZ/L 10,200-193-50-ABCD
K1RNS 1598- 47-34-A
W1IPB 324- 27-12-A
W1QHS/L 320- 40- 5-B
W1ULU 198- 22- 9-A
W1MHL/L (19 ops.)
99,158-1082-86-ABCD
W1ALE (W1s TNO YQH)
5846-158-37-AB
W1GOM (4 ops.)
801- 89- 9-B
W1DDN/L (W1DDN,
K1AWR) 32- 4- 4-ADE

Rhode Island

W1AJR 13,380-209-60-ABCD
K1CRN 1914-151-14-B
K1PAM 660- 55-12-A
W1JWZ 553- 37-15-A
K1DFU 240- 24-10-A
W1FEO 75- 15- 5-B

Vermont

W1UIZ/L 29,325-389-69-ABCD
W1EXZ 1445- 85-17-A
W1MMN 40- 10- 4-B

NORTHWESTERN DIVISION

Montana

W7EGN/7 592- 37-16-A
K7CTI 318- 29-11-A
W7UPR 12- 6- 2-A
W7NOZ 3- 3- 1-A
K7PKN 3- 3- 1-A
W7DWR 2- 2- 1-A

Oregon

K7AAD 315- 21-15-A
W7HHB 243- 26- 9-ABD
W7DTT¹ (5 ops.)
5580-186-30-AB
K7AUO/7 (8 ops.)
2599-111-23-ABD

W7ICS/7 (W7s ICS WKP
QLC) 672- 86-12-AB

Washington

W7RT 11,938-253-47-ABC
K7BRQ 3780-140-27-A
K7BBO 1980-132-15-AB
W7ZQX 1320- 80-19-AB
K7GKK 840- 70-12-A
K7JZP 523- 69- 8-AB
K7IVC 400- 50- 8-A

W7RDY/7 (W7s RDY UGK)
7344-204-36-AB
W7HZ/7 (multiple-operator)
5044-177-26-ABCD

PACIFIC DIVISION

Nevada

K7HRW 4154-134-31-AB
K7ICW 560- 28-20-A
W7JU 36- 12- 3-B

Santa Clara Valley

W6YX⁵ 8510-175-46-ABCD
W6ASH 4080-123-30-ABC
W6HDN 3552- 8-24-AB
W6GGV 657- 59- 9-BCD
W6ORR/6 357- 51- 7-B
W6VJS 102- 34- 5-AB
K6PCQ 41- 1- 1-B
W6LSS 41- 1- 1-B
W6ISO/6 (5 ops.)
2975-112-25-ABCD

East Bay

K6RNG 3348-101-31-AC
K6OMH (5 ops.)
11,501-360-31-ABC
W6NEL (W6s NEL BZA)
171- 19- 9-A

San Francisco

W6PMS 252- 63- 4-B
K6VXI 306- 8- 4-A

Sacramento Valley

K6YH 1133- 75-15-AB
W6MLN 531- 37- 9-ABCD
K6AAW/6 (K6s AAW ERQ,
W6HBU)
438- 56- 6-AB

San Joaquin Valley

W6HJ 5880-143-40-ABE
W6FZA 3066- 7-42-ABC
W6QZ 1848- 77-24-AB
W6SDM/6 (W6s SDM, ELT,
K6DAH)
5328-129-36-ABD

ROANOKE DIVISION

North Carolina

K4HGK 833-23-41-A
K4SWN 1596- 76-21-AB
K4MHS 1700- 85-20-AB
W4BZ 94- 47- 2-B
K4GPL 21- 21- 1-B
W4WDH 19- 19- 1-B
W4BUU 8- 4- 2-B
W4NC/4 (12 ops.)
3081-164-31-AB
W4GNE/4 (4 ops.)
2352-112-21-AB

South Carolina

W4TLC 2100- 68-30-ABC
W4DEN 2028- 78-26-A
K4JY 400- 10-10-AB
W4VIV 56- 13- 4-ABC

Virginia

K4VWH 13,780-265-52-AB
W4LTU 11,650-233-50-AB
W4DOE 3654-126-29-AB
K4PCL 2328- 97-24-A
K4TNB 1596- 76-21-AB
K4RMT 1173- 69-17-A
K4YYJ 810- 54-15-AB
W4KNS 710- 71-10-B
K4CGA 216- 27- 8-A
K4AJE 168- 28- 6-AB
W4GOC 150- 25- 6-A
W4HHD 144- 36- 4-A
W4KMS 77- 11- 7-A
K4SMH 10- 5- 2-A
K4RAY¹ (5 ops.)
13,104-312-42-A
W4KDH (5 ops.)
8280-207-40-AB
K3LUK/4 (4 ops.)
7920-240-33-AB
W3DHQ/4 (W3s DHQ KDZ)
180- 15-10-AB

West Virginia

K8BLR 2942- 98-29-A
K8HYE 396- 33-12-A
K2GLQ/8 (6 ops.)
13,410-298-45-AB

ROCKY MOUNTAIN DIVISION

Colorado

W0AZT 4142-109-38-AB
K7FSD 452- 35-13-A
K6MNV 7- 1- 1-B

New Mexico

K5UNK/5 1460- 73-20-A

(Continued on page 154)

**WE'RE
LOOKING
FOR A
VERY
RARE BIRD.....**



The long-haired, eggheaded perfectionist (genius electronicus). Frequently seen edging out of interminable, pointless conferences with a disenchanted look on its beak. Wears track shoes, has clock in chest — always in a hurry to get things done. Always sticking neck out — hence bandages.

Very dedicated problem-solver. Thrives in climate of responsibility. Prefers pressure to boredom. "Marches to a different drumbeat" (Thoreau). Distinguished by integrity marks on brow. All in all, a very superior type.

This species was once considered doomed to extinction, but 5 years ago, we established a sanctuary for them here at JRL. If you see (or happen to be) one of these creatures, send a resumé to Mr. Loebe Julie, M.S.S. (Member of the Same Species) for immediate consideration.

Our Research/Development/Production/Engineer/Writer and Technician birds are all very well treated. We are especially successful at the development of fledglings, particularly if they were the best in the nest.

A word about JRL — we have established an unparalleled record of successful breakthroughs in a broad area of PRIMARY STANDARD ELECTRONIC INSTRUMENTATION. We were the first to achieve practical production of 0.0001% voltage dividers, 0.0002% long-term standard-cell references, 0.0015% resistors, 0.0015% voltage-current potentiometers, and many more. We are currently hard at work on even more sophisticated problems. Care to get off the ground and fly with us?



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QST BINDERS

As QSTs get older, they become more valuable. Are your 1961 copies scattered sloppily about the shack? If so, why not file them neatly. The best way to accomplish this is to place them in sturdy, good-looking QST Binders.

Finished in reddish-brown fabrikoid with stiff covers, each Binder holds twelve issues of QST, opens to any page and lies flat. Your copies are protected and always available for easy reference.

Each—\$3.00 {postpaid}

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AND POSSESSIONS

AMERICAN
RADIO RELAY LEAGUE, Inc.

West Hartford 7, Connecticut

Franky the Frog says: **HAPPY BIRTHDAY** on completing one whole year at THE AMATEUR HEADQUARTERS of Southern New England where six HAPPY-HANDY-HAMS help beginner and oldtimer in the same eager manner that has been a regular feature for the past thirty-three years.

A complete stock of name brand equipment which includes COLLINS, ELMAC, GONSET, HALLICRAFTERS, HAMMARLUND, HY-GAIN, E. F. JOHNSON and NATIONAL RADIO is always maintained

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Kreco CO-AXIAL ANTENNAS

All Aluminum

LIGHT • STRONG • EFFICIENT

2 METERS	MODEL CO-2A	15.00 net
6 METERS	MODEL CO-6A	24.00 net
10 METERS	MODEL CO-10A	30.00 net
27 MC	MODEL CO-CBA	33.00 net

These models are ordered cut to exact frequency		
30 to 50 MC	MODEL CO-30A	30.00 net
50 to 100 MC	MODEL CO-30A	24.00 net
108 to 470 MC	MODEL CO-150A	15.00 net
3/4" Aluminum Pipe	per foot	1.00 net
RG-8/U with 2 PL 259s attached	per foot	.20 net

ASK YOUR DISTRIBUTOR OR WRITE
HERB KRECKMAN CO. • CRESCO, PA

K5UYF 1260-60-21-A
K5WGE/5 (K5s WGE PPB
HMT) 9072-252-36-AB
W1HDQ/5 (W1HDQ, K5s
TQF UNK)
836-44-19-AB

W'oming
W7VTH 1869-89-21-A
W8KNC/7
1188-54-22-A

SOUTHEASTERN DIVISION

Alabama
W7JCU/4
4560-114-40-A
K4MEQ 560-40-14-A

Eastern Florida
W4LIP 15,048-396-38-A
K4ACF 8890-254-35-A
K4RNG 7040-160-44-A
K4VSG (K4s VSG TIG)
13,300-350-38-A

Western Florida
K4HYL 7040-176-40-A

Georgia
K4JPD 10,512-219-48-A
K4KLD 1210-54-22-ABC
K4YKG 1007-53-19-A
W4DGE 970-61-16-AB
K4YFU 935-55-17-A
K4FNZ 930-62-15-AB
K4UPK 561-33-17-A
K4QOC 100-25-4-AB
W4GIS 22-11-2-B
K4KGN 21-7-3-A
K4TXK 14-14-1-B
K4YZE 12-12-1-B
W4FWH/4 (W4s FWH
VHH) 7488-189-39-ABC

SOUTHWESTERN DIVISION

Los Angeles
W6NLZ 8624-149-49-ABCDE
W6BWQ 984-41-24-A
W6ABN 690-30-23-A
W6DHH 364-26-14-A
W6NSN/6 (4 ops.)
16,200-337-45-ABCD
W6MLA/6 (5 ops.)
5360-264-20-ABC
W6UFJ/6 (4 ops.)
564-72-12-AB

Arizona
W7RUC 9912-236-42-A
K7MBI/7 (K7MBI, W7PXE)
7942-209-38-A

San Diego
W4GJM/Q
13,932-258-54-A
W6ZOP/7
9996-331-28-ABCDE
K6DLY 2-2-1-B
K6DBZ (4 ops.)
17,306-301-34-ABE

Santa Barbara
W4ABZ/6
135-27-5-AB
W4EAT/6 (6 ops.)
20,200-400-50-ABCDE

WEST GULF DIVISION

Northern Texas
W8SFW
13,536-282-48-A
K5TXX 6346-167-38-AB
K5VBN 4185-135-31-A
W5PVT 2912-112-26-A
K5ZMS 2910-97-30-A
K5ARU 2060-103-20-A
K5BRN 1332-74-18-A
K5VRY 8294-46-18-A
W5AQ8 618-44-14-AB
K5MTK 492-41-12-A
W5PEG 72-12-6-A
W5DXQ 12-6-2-A
K5TKR (K5s TKR ZBM)
14,500-289-50-ABC
K5KWB (K5s KWB RVE)
11,280-282-8-A

Oklahoma
W5JSD 7280-208-35-2
K5WQE 5882-173-34-A
K5ZTH 4068-113-36-A
K5DFM 3872-121-32-A

Southern Texas
K5LEP 4454-131-34-A
W5TGO 4524-156-29-A
W5BRR 416-26-16-A
W5ND (13 ops.)
10,304-222-46-ABE
K5RCO (K5s RCO EFL)
4080-120-34-A

CANADIAN DIVISION

Maritime
VE1BC 1860-124-15-A
VE1ABL/1 (VE1s CL MX
ABL) 1040-65-16-AB

Ontario
VE3DIR 5358-141-38-AB
VE3AIB 3720-118-31-ABC
VE3RM 3480-145-24-AB
VE3DUX 2944-128-23-AB
VE3APF 2520-140-18-AB
VE3CIA 1184-74-16-AB
VE3AGU 910-65-14-A
VE3HW 845-65-13-AB
VE3ESE 260-35-4-B
VE3BYU 144-48-2-B
VE3CUG 135-27-5-B
VE3RPH 84-28-3-B
VE3AAH 440-25-2-B
VE3BWL 17-17-1-B
VE3ELA/3 (VE3s ELA CUB)
4760-170-28-AB

Manitoba
VE4RE 2277-99-23-A
VE4YW 2100-105-20-A
VE4HS 308-28-11-A

Saskatchewan
VE5GI 28-7-4-A

Alberta
VE6DB 760-35-20-A
VE6FF 160-16-10-A

British Columbia
VE7ASM/7
2205-105-21-AB
VE7ARV/7 (8 ops.)
1246-88-14-ABC

Yukon — N.W.T.
VE8BY 105-15-7-A

¹ Multiple-operator Award Winner; ² W2YLM, opr.;
³ Novice Award Winner; ⁴ Hq. Staff, Not Eligible for
Award; ⁵ W7QDJ, opr.; ⁶ VE7AFB, opr.
Check log: XE10E.

OSCAR Tracking

(Continued from page 47)

The antenna operator will need a signal-strength indicator (audio-output meter works fine), as well as be able to hear the signal from the speaker. The clockwatcher/recorder must have a place to write.

A fourth person could be recruited to operate a tape recorder, and put time signals on the tape. Tape recorders generally run accurately enough so that reruns can be timed closely with only one time entry required.

FORMAT III

Same as Format II, except:

Antenna: Multi-element 2-meter beam, moveable in both azimuth and elevation, with indicators at receiver location. Set azimuth indicator to read 0° when beam points at TRUE NORTH. Set elevation indicator to read 0° (Please turn the page)

LOOK AT THESE VALUES! IT'S THRIFTY TO BUY FROM US!

PLATE TRANSFORMER

Price: **\$3.95**

Pri: 117 VAC at 60 CPS.
Sec: 1300 VAC at 145 Ma.
(No C.T.). Also has 5.3
VAC at 5 Amps. Fil.
Winding. 4 1/2" H x 3 1/4"
W x 4 1/2" D.
Weight: 11 lbs. Stock
#T-1001.

COAXIAL CABLE . . . FACTORY FRESH STOCK!

Type	Nominal Impedance	Price per 100'	Price per 1000'
RG-8/U	52 Ohms	\$8.50	\$80.00
RG-8A/U	52 Ohms	12.00	115.00
RG-11/U	72 Ohms	8.00	75.00
RG-11A/U	72 Ohms	9.00	85.00
RG-58/U	52 Ohms	4.50	40.00
RG-58A/U	52 Ohms	5.00	44.00
RG-59/U	72 Ohms	4.50	40.00
RG-59A/U	72 Ohms	5.00	44.00

HIGH-VOLTAGE OIL CAPACITORS

2 Mfd. at 6,000 VDC. \$9.00
Cornell-Dubilier 4 Mfd @
4000 VDC. \$9.95 (3 for \$27.00.)
30 Mfd. at 1000 V.D.C. Re-
moved from equipment. Lab
checked for quality. Perfect for
SSB transmitters or Photo
Flash Units.
Size: 5 1/4" H x 5 1/4" W x 1 1/2" D.
95¢ each

TA-36 BY MOSLEY

Prepaid/U.S.A. . . . **\$129.50**

For 10-15-20 wide spaced, six
element configuration. Excellent
forward gain and F/B ratio.

SWR: 1.5/1 or better at resonance
Transmission Line: 52 ohm coaxial.

IN STOCK: National NC
190, NC 303, NC 480 Ham-
marlund HO 145-C, John-
son Courier, Ranger & Val-
iant.

HQ. FOR TUBE SPECIALS

2E26	\$1.95	1625	\$3.55
866A	1.75	813	13.50
3B28	2.75	5763	1.75
	807		\$1.10

WRITE FOR COMPLETE LIST!

PROP-PITCH MOTOR

\$35.00

We have another lot of the de-
sirable Prop-Pitch Motors suitable
for rotating the heaviest Ham or
Commercial Rotary Beam. These
are the large motors weighing 80
lbs. each net. Packed they will still
weigh under the 100 lb. limit for
economical motor freight. All in
good used condition.

7 Conductor Color-Coded Outdoor Cable
3/4" Diameter. 06¢ per ft. (1,000 Ft. Spool \$50.00)

Swinging Choke: 100 Ma./5 Hys; 50 Ma./20 Hys. 70 Ohms. \$2.50.

Selenium Rectifier: Up to 50 V.AC/Up to 45 V.DC out, @ 8 A. \$9.75.

Dual Fil. Xfrm: Pri: 115 VAC @ 60 CPS. Sec: (1) 6.3 @ 5.5 A.; Sec: (2) 6.3 @ 2.75 A. \$3.75.

7' Line Cord: 3 Conductor polarized, Heavy-duty, 40¢ . . . 3 Prong to 2 Prong Adapter @ 25¢.

Weston Model 476 3 1/2" Rd. Meter: 0 to 10 VAC. \$2.95.

Weston Model 301 3 1/2" Rd. Meter: 5 Ma. Movement. Dual scale: 0-150 & 0-300 VDC. \$3.95.

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when beam is horizontal, and 90° when beam is vertical. Read azimuth indicator 0° to 359° clockwise from TRUE NORTH. Read elevation indicator 0° to 90° horizontal to vertical.

Personnel: Four — receiver operator, azimuth antenna operator, elevation antenna operator, clockwatcher/recorder.
Data Required: (Same as Format II except entries for elevation bearings in column 3 where OSCAR was first heard, and each succeeding integral minute.)

Procedure:

This format is applicable to those stations having a beam that can be rotated in both azimuth and elevation. When receiving OSCAR signals arriving from high elevation angles, signal-strength improvements of 4 to 6 db. can be obtained if the antenna can be raised in elevation. Two indicators and separate azimuth and elevation rotor controls are necessary.

Azimuth antenna operator points antenna in the predicted direction. Elevation antenna operator sets elevation to 0°. Receiver operator sets receiver to correct frequency, or tunes slowly around the expected frequency. Receiver operator calls out when he first hears OSCAR signal, and clockwatcher/recorder enters time in column 1. Antenna operators then swing the beam across the signal in azimuth and elevation, and each operator calls out the bearing of maximum signal strength. Clockwatcher/recorder enters the azimuth bearing in column 2 and the elevation angle in column 3 of the report form. Clockwatcher/recorder alerts the antenna operators several seconds before the next integral minute, and each minute thereafter, and the antenna operators swing the beam across the signal, trying to have the beam pointed in the direction of maximum signal exactly on the minute, each calls out his bearing, and the clockwatcher/recorder enters the azimuth bearing and elevation angle. Receiver operator, while keeping the signal tuned in and the beat note audible, can determine the HI-rate.

The azimuth and elevation antenna operators must cooperate in their actions, or neither will be able to get accurate bearings. Each can watch the same signal-strength indicator, but if one operator gets too far from the correct bearing, the other operator will have difficulty in getting a good bearing. With practice, good bearings can be obtained.

On directly overhead passes, the azimuth bearing will not change much, but the elevation angle will increase slowly, then at a faster rate until directly overhead (elevation 90°). At this point, the azimuth operator must rotate the antenna 180°, so the elevation operator can follow the signal as the elevation angle decreases toward 0°. When OSCAR passes nearby, but not directly overhead, both azimuth and elevation operators will be kept busy.

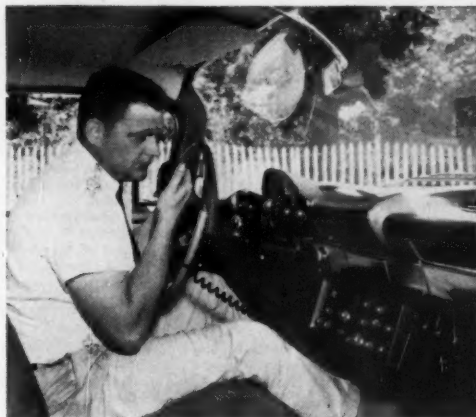
FORMAT IV

The requirements for this format are just like those for Format III, with the addition of Doppler data for column 6. Doppler data is derived from the received signal; it is caused by the motion of the transmitter with respect to the listener, and is measured by determining the change in received frequency with respect to time. To get a complete Doppler curve, a receiving method that differs somewhat from those described in Formats II and III must be used.

The antenna operators perform as in Format III, and time of acquisition is determined as before. However, the receiver operator tunes in the signal, sets the receiver b.f.o. or external oscillator for a low audio beat note that will rise in frequency as OSCAR approaches. Thereafter, no receiver tuning or changing of the beat frequency can be permitted. If an external oscillator signal (at OSCAR's frequency) is being injected into the receiver to create a beat note, (receiver b.f.o. off) the receiver can be tuned for beat signal strength. However, any changes in the frequency of the external oscillator or the b.f.o. signal will change the beat note, and spoil the Doppler data. The change in the beat note contains the Doppler data, and we are interested only in those changes caused by the changes in the frequency of the received signal. Any other changes reduce the accuracy.

Reduction of Doppler data consists of measuring the rate of change in frequency with respect to time. This is a fairly easy task, but requires time. So, for OSCAR purposes, record the audio output of the receiver by placing the recorder microphone near the receiver speaker. Record a minute time mark on the tape just before you start to record the OSCAR signal. One time mark is usually sufficient. Then you can reduce the Doppler data after the pass is over and, if neces-

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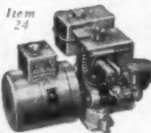
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bary, run the tape several times to improve your accuracy.

As OSCAR nears your station, and passes on, the audio beat note will rise, and near the end of the track, the beat frequency will approach 8 kilocycles. This beat note will be difficult to hear and is hard to use for antenna pointing purposes. Some difficulty will be experienced in obtaining good antenna bearings. Receiver bandwidth cannot be narrowed, since the receiver must pass both the OSCAR signal and the external oscillator signal, which near the end of the track will be nearly 8 kilocycles apart. Most everyone can hear an 8-ke. tone, but distinguishing it from the noise, and turning the antenna to make the tone stronger, gets difficult.

One solution to this problem is to use two receivers, fed from the same antenna, or two i.f. systems (receivers) fed from one converter output. Set up one receiver to obtain Doppler data, and record its audio output. Adjust the b.f.o. on the other receiver to keep the beat note in the audible range, and use its output as an aid in pointing the antenna. This requires two receivers, but does provide both Doppler data and antenna-pointing assistance.

To reduce the Doppler data, measure the frequency of the audio beat note as recorded during the track, at regular time intervals. For example, play the tape and by comparing the audio beat note and the output of a calibrated audio generator, measure and write down the frequency every thirty seconds throughout the tape. Then plot the frequencies against time (every thirty seconds) on linear graph paper. Time zero is the time you recorded on the tape just before the Doppler recording. Then join the plotted points with a smooth curve, and it should look like an "S", somewhat distorted, but nevertheless S-shaped. The time at the center of the S-curve corresponds to the "time of closest approach" — that is, the time when OSCAR was nearest to your receiving antenna.

Format IV will require additional equipment to derive Doppler data:

1. Tape recorder with microphone
2. Calibrated audio oscillator
3. Oscilloscope to aid in measuring audio frequency
4. Linear graph paper to plot Doppler curve

The Doppler data and the methods of deriving it are probably new and strange to the average amateur. However, practice in measuring the frequencies on the tape. You need not record an entire track. Any portion of the audio whose frequency change is due to OSCAR's motion will yield Doppler data. Obviously, the longer this portion of the tape, the more data you get. The most important point on the Doppler curve is its center. This point occurs at the time of closest approach (TCA) and the received frequency to this point equals the transmitted frequency, as Doppler shift at TCA is zero.

Enter the received audio frequencies in column 6 of the report, each frequency corresponding to the time in column 1.

The above instructions and outline may seem formidable, but a "practice run" or two should develop a smooth-working team, capable of deriving good-quality tracking data. Listen to WIAW for latest OSCAR news! Be alert! Don't let the launch date catch you napping. Good luck!

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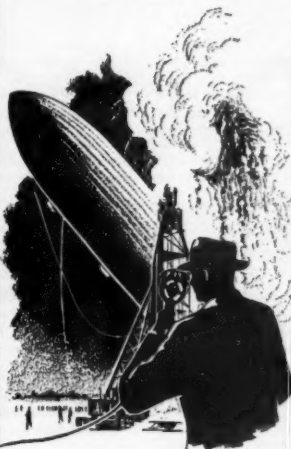
(Continued from page 49)

Transistors, compiled by the staff of Gernsback Library, Inc., 154 West 14th St., New York 11, N. Y. Cat. No. 94. 95 pages, 5½ × 8½. paper cover. Price, \$1.95.

This book contains a selection of edited articles from *Radio-Electronics* magazine. These articles cover practical circuits, information on how to test transistors, how to build all-transistor test equipment, such as a power transistor tester, direct reading transistor tester, lab type transistor checker, TV bar generator and scope calibrator. Complete parts lists and detailed descriptions accompany the diagrams and illustrations of the equipment.

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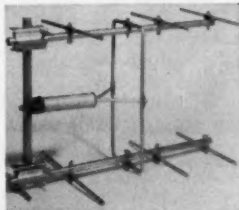
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Building Up Your Ham Shack, by Howard S. Pyle, W7OE. Published by Howard W. Sams & Co., Inc., 1720 East 38th St., Indianapolis 6, Indiana. 128 pages, 5½ by 8½ inches, paper cover. Price, \$2.50.

A discussion of the basic equipment needed to assemble and place an amateur radio station on the air. It is confined mainly to commercial equipment and kits.

Repairing Transistor Radios, by S. Libes. Published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y. Cat. No. 270. 168 pages, 5½ by 8½ inches, paper cover. Price, \$3.50.

There is quite a difference between servicing a transistor radio and servicing a vacuum tube set. This book was written to present the special techniques required when servicing transistor radios. Also included is an evaluation of transistor portables, multiband receivers, imported receivers, all-transistor sets, auto-hybrid and f.m. radio receivers. The repair sections of the manual include step-by-step procedures, trouble check points and charts, along with information on construction of special purpose test equipment. There are interchangeability charts covering most of the transistors that appear in transistor receivers.

Fundamentals of UHF, by Allan Lytel. Published by John F. Rider Publisher, Inc., 116 West 14th St., New York, N. Y. 6 by 9 inches, 160 pages, paper cover. Price, \$3.90.

What with the expanding interest in the u.h.f. portion of the amateur spectrum, this book should be of interest to both the experienced and newcomer to u.h.f. The text covers antennas, transmission lines, wave propagation, communications equipment and test equipment that fall in the 300 to 3000 Mc. region. Emphasis is placed on the differences between techniques and communications on these frequencies and at lower frequencies. Typical chapters include u.h.f. oscillators, amplifiers and receivers, resonant lines, principles of television.

Oscillator Circuits, by Thomas M. Adams. Published by Howard W. Sams & Co., Inc., 1720 East 38th St., Indianapolis 6, Indiana. Basic Electronics Series, Cat. No. BEO-1. 125 pages, including index, 5½ by 8½ inches, paper cover. Price \$2.95.

Covering the nine basic oscillator circuits in detail isn't an easy job. However, this book uses a unique four-color diagram method to demonstrate exactly what happens inside an oscillator circuit. The book covers oscillator circuit fundamentals, and has an introduction that includes background on basic electrical fundamentals necessary to understand oscillator material in the following chapters. The nine chapters following the introduction are devoted to different basic oscillators. They are: Crystal oscillators, the Hartley oscillator, the Colpitts oscillator, the tuned-plate-tuned-grid oscillator, the electron-coupled oscillator, the phase-shift oscillator, the blocking oscillator, multivibrators, and thyatron sawtooth generators.

Essentials of Radio-Electronics, by Morris Slurzberg and William Osterheld. Published by McGraw-Hill Book Company, Inc., 330 West 42nd St., New York 36, N. Y. 6½ by 8½ inches, 716 pages, including index. Cloth cover. Price, \$10.00.

An all-round electronics text, this second edition brings up-to-date an over-all coverage of principles of operation of vacuum tubes and transistors, their basic circuits, the application of the circuits to audio and to radio receivers. It has an additional chapter on test equipment and test procedures, as applied to radio receiver circuits. Each chapter finishes with a series of questions covering material contained in the chapter. Some highlights in the book are chapters on the theory of operation, basic circuit application and composite radio receiver applications of transistors. There is

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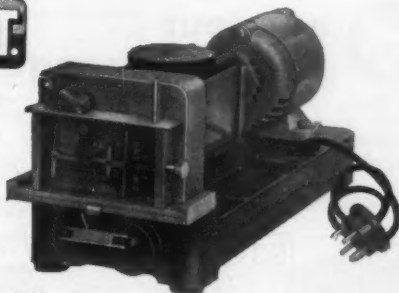
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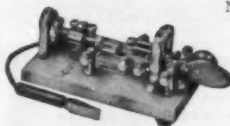
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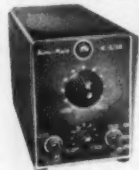
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Basic Mathematics, Vol. 1 by Norman H. Crowhurst. Published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y. 6 by 9 inches, 152 pages, paper cover. Cat. No. 268-1. Price, \$3.90.

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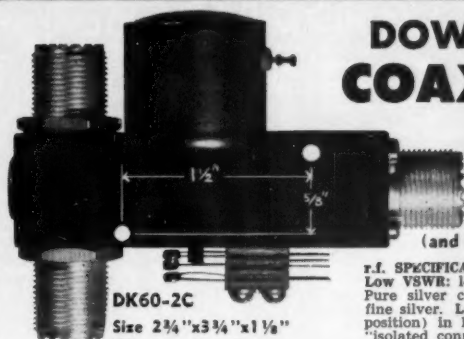
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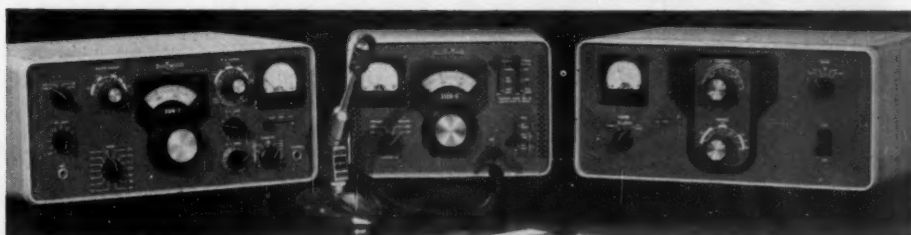
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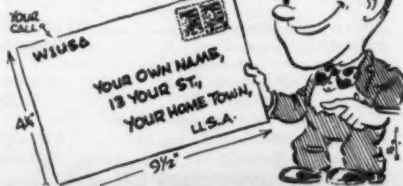
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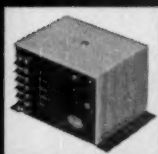
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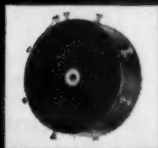
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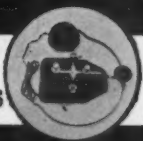
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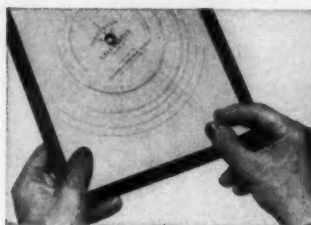
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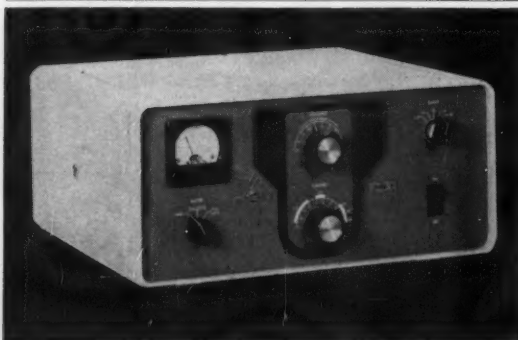
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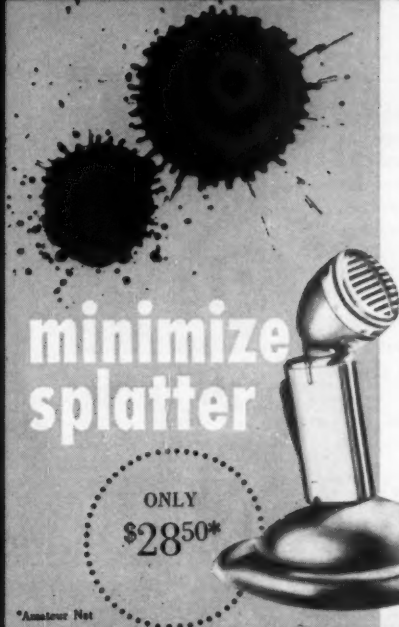
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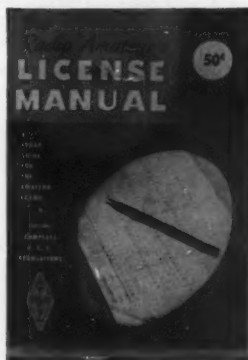
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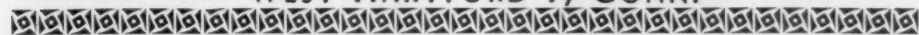
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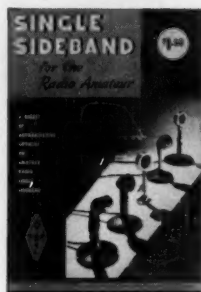
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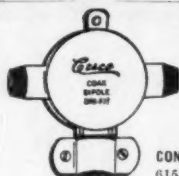
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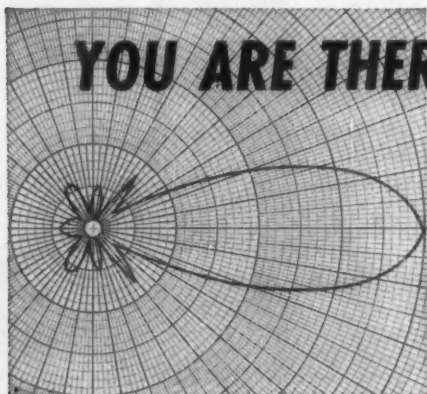
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Completely moisture proof. For use with coax cables RG-8, RG-58, RG-11, RG-59 and 300 ohm twin tubular. Has eye pull up for inverted V's.

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Install a Telrex antenna...dollar for dollar better in every way! Antenna systems from \$6.95 to \$12,000.00

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NOW! A Broad-Band "Balun" for your
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HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. Since Ham-Ads are not carried on our books, no cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.

(6) A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature. This advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate is more easily avoided. It is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

PEORIA Hamfest, Sept. 17, Peoria Area Amateur Radio Club. Tickets \$1.00 until Sept. 9. Write Steve Perry K9AXG, 505 E. Jefferson St., Washington, Illinois.

SYRACUSE VHF Club 7th Annual Roundup October 7, 1961. Three Rivers Inn; speakers, awards, floorshow, steak dinner. Write K2TX, 236 Ester St., Milford, Conn.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

MOTOROLA used FM communications equipment bought and sold W5BCO, Ralph Hicks, Box 6097, Tulsa, Okla.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Factory service at reasonable prices on Collins, Hallicrafters, Hammarlund, Gonset, National, Harvey-Wells. Our 25th year, 90 day guarantee. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

COMPLETE Service: Transmitters and receivers. QSLs. Reasonable. K9DGG, Keith, 601 East 4th St., South, Newton, Iowa.

WE Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., 199 Front St., Hempstead, L.I., N.Y.

DON'T Fall FCC tests! Check yourself with a time-tested "Sure-check Test". Novice, \$1.50; General, \$1.75; Extra, \$2.00. We pay the postage. Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

TRIGGER. Cash paid for ham equipment. 7361 W. North Ave., River Forest, Ill. PR 1-8618. Chicago #TU 9-6429.

TOROIDS: Uncased 88 Mhz, like new. Dollar each. Five/\$4.00 P.E. DePaul, 309 So. Ashton, Milbrae, Calif.

WANTED: Cash for surplus test manuals, one or one hundred. State condition and equipment type. W4FXQ, Box 2513, Norfolk, Va.

WANTED: Commercially-built transmitters and QST for any months of 1922, 1923, 1939 and 1940. Al T. O'Neill, Camp Lakeview, Lake City, Minn.

WANTED: Transmitter, receiver, escapement for airplane. W6DFR.

SELLING My entire station: Vikings Vallant. \$200: HO-140X, \$130.00; DR-24 Preselector, \$25.00; DX-35, \$25.00; Raymond Neubecker, K5T, 2001 Corners Road, Wappingers Falls, N.Y. Tel. AXminster 7-7030.

SOUTHERN California: Transmitters and receivers repaired, aligned. Bandwidth, frequency, harmonics measured. Used ham gear bought, sold, traded. Robinson Electronics, 922 W. Chapman, Orange, Calif. Tel. Kellco 8-0500.

WANTED: All types of aircraft or ground radios, 17L, 618S, 388, 390, 18S units. Especially any item made by Collins Radio whatsoever. Also large type tubes and test equipments. For fast action write Ted Dames, W2KUW, 308 Hickory, Arlington, N.J.

SAN Francisco and vicinity: Receivers repaired and realigned. Factory methods. Special problems invited, any equipment. Associated Electronics, 38 South P Street, Livermore, Calif. Skinner, W6KFF.

FOR Sale: Vacuum relays. Jennings Radio Mfg. Type R-2, test 50 Kv, RMS amperes, 20 at 30 Mc insulation 30 Kv. Solenoid 115V AC, R2-50-No4-S2. Drawings VSM3 358.1. Inquiries invited. J. G. Cree, 100 South Second St., Chambersburg, Penna.

WANTED: Heathkit KS-1 power supply. Klt or completed unit. Send card stating condition and price. K4VUQ, Goodin, 486 Hollyhill Dr., Lexington, Ky.

QSLs? SWLS? WPE? Variety samples 20¢ (refunded). QSL samples with Bible verses, 10¢. Callbooks (Fall), \$5.00. Rus Sakers, W8DJD, Box 218, Holliston, Mich.

C. FRITZ for QSLs that guarantee better DX returns! Samples 25¢ deductible. Box 1684, Scottsdale, Ariz. (formerly Joliet, Ill.)

QSLs. Twenty exclusive designs in 3 colors. Rush \$3 for 100 or \$5 for 200 and get surprise of your life. 48-hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLs. Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Samples 10¢. K2VOB Press, 62 Midland Blvd., Mantlewood, N.J.

QSL-SWL-CB-WPE. Finest. Since 1946. Largest assortment. Priced right. Send 10¢ for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md.

QSLs "Brownie." W3CJL, 3110 Lehigh, Allentown, Penna. Samples, 10¢ with catalogue, 25¢

QSLs-SWLS, Samples 10¢. Malco Press, 1937 Glensdale Ave., Toledo 14, Ohio

QSLs. Faster, lower prices. Catalog 25¢ (refundable) samples stamped envelope. Dick Crawford, K6GJM, Box 607, Whittier, Calif.

DELUXE QSLs. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢

CREATIVE QSL and SWL Cards. Are you proud of your card? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Wilkins, Jr. Creative Printing, P. O. Box 1084-C, Alhambra, Calif.

SUPERIOR QSLs, samples 10¢. Ham Specialties, Box 3023, Bellaire, Texas

QSLs. 3-color glossy, 100-\$4.50. Rutgers VarTyping Service, 7 Fairfield Rd., Somerset, N.J.

QSLs-SWLS. 100 2-color glossy, \$3.00. OSO file cards, \$1.60 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

PICTURE QSL. Cards of your shack, home, etc., Made from your photograph, 1000, \$13.00. Kaum's, 4154 Fifth St., Philadelphia 40, Penna.

QSLs. 300 for \$3.95. Free Samples. W9SKR, "George" Vesely, R.R. #1, Box 208-A, Ingleside, Ill.

QSLs. SWLS. XYL-OMs (sample assortment approximately 94¢) covering designing, planning, printing, arranging, mailing; eye-catching, complete, sedate, fantabulous, DX-attracting, tropical, snazzy, unparagoned cards (Wow!). Rogers, K6AAB, 961 Arcade St., St. Paul 6, Minn.

QSLs-SWLS. Samples free. W4BKT Press, 123 Main, McKenzie, Tenn.

1/4" Call QSLs (2 sides printed), 100, \$2.75 samples free. Gariety, 2624 Crocker, Ft. Wayne, Ind.

QSLs. Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLs. Samples dime. Rubber stamps: name, call and address \$1.35. Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSL: samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

QSLs. \$2.50 and up. Samples 10¢. RLB Print M.R. 12 Phillips, N.J.

QSLs. Samples 10¢. W7IIZ, Wines, Box 183, Springfield, Oregon.

FREE Samples. Economical QSLs-SWLS. Bolles, 7701 Tisdale, Austin, Texas.

RUBBER STAMPS. \$1.50. Call and Address Clint's Radio, W2UDG, 32 Cumberland Ave., Verona, N.J.

QSL-SWLS that are different, colored, embossed card stock, and "Kromekote". Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

QSL's 100 glossy 4 color \$3.70 Postpaid. Samples 10¢, or send 25¢ for large assortment and free "Danger. High Voltage" sign. Dick W8VXK, Rt. 1, Gladwin, Michigan.

QSLs. Outstanding. Priced right. Dime. Filmcrafters, Box 304, Martins Ferry, Ohio.

RUBBER STAMPS for hams, sample impressions. W9UNY, Hamm, 542 North 93, Milwaukee, Wis.

QSLs by Bob. W1HOU, 194 Melrose St., Manchester, N.H.

QSLs. Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

100 QSLs: 80¢. Information 10¢. Meininger, Jesup, Iowa.

PHOTOGRAPHIC QSL cards. Send \$3.00 for 100 your snapshot. Free. Globe Arizona.

YLRL Specials. OM's, reasonable, nice designs, samples dime. W2DJH Press, Warrensburg, N.Y.

QSLs. Large selection styles including photos. Lowest prices. Fast service. Samples dime. Ray, K7HLR, 679 Borah, Twin Falls, Idaho.

QUALITY QSLs. New designs, samples 10¢. Giant, 25¢. Savory, 172 Roosevelt Rd., Weymouth, Mass.

QSLs Samples 10¢ refundable. United Printing Co., 2802-30th Street, Seattle, Washington. Phone Parkway 2-2233.

CANADIANS! 70 ft. steel telescoping tower, prop-pitch motor, power supply, seisms, control unit, pictures on request. Horner Model TB 600 beam, 150 ft. coax cable, also 20A desk model, relay, D-104 mike and stand; HRO-60, A.B.C.D coils matching speaker, also 3/4 tone Emerson air conditioner for shack. All items list class. VE3DZY, Box 1262, Atikokan, Ont. P., Can.

COLLIN 75A4, manufactured in U.S., like new, \$550. D. Alan Page, 629 Squin Crescent, Port Credit, Ont., Canada.

WANTED Good used or new 833A's and 813's priced right. W4BPD (QTH correct).

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA, Wayne Nelson, Concord, N.C.

WANTED: Military or Industrial laboratory test equipment. Electronicraft, Box 399, Mt. Kisco, N.Y.

170

WANT: VFO-driver, bandswitching 80 thru 15. Output at least 20 muls for driving a 4-400A. Homebrew or commercial. Must be in good shape. WILWV, 99 Water, Millinocket, Me.

SELL: HQ-100, with clock. Best offer. Chuck Wilson, Shelby, Mich.

FOR Sale: 6-meter Gonset Communicator III with 5 crystals. Price: \$180. Bernard Hellriegel, 83 Mountain Ave., Summit, N.J. Tel. CRestview 7-0258.

NC-98 with speaker in excellent condx. \$90. Bill Dunsmore, K4KIR, 4605 Seventh Ct. So., Birmingham, Ala.

KWM-2, blander, AC-DC supply. Mobile Mount. speaker. FB. \$195. F.o.b. take 50% trade. F.o.b. Bill, 1305 Lum, Corpus Christi, Texas.

SELL: AR88 receiver, perf. condx. in cabinet, with 5 meter, \$150 F.o.b. Outstanding performer. W6WMA. Colonel C. E. Howland, 910-19th St., Pacific Grove, Calif.

\$50 takes Hallicrafters S-20R receiver and Heath Q multipl. bud FCC90B 100 kc. calibrator. WLE ant. tuner. Mod. AT-3, all manuals included. F. Lewis, WAZFWX, Rock Tavern, N.Y.

SELL: Globe Hi-Bander. In exc. condx. \$85.00. K2PDS, 41 Elbertson St., Elmhurst, Queens, L.I., N.Y. DE 5-0737.

FOR Sale: Meissner 8C FM tuner, \$10; BC659 and BC620, \$7 each; SX-100, \$170. K9ESE, 19D University Houses, Madison 5, Wis.

A-1 reconditioned equipment. On approval. Trades. Terms. Hallicrafters S-85 \$79.00, SX-99 \$99.00, SX-100 \$199.00, SX-111 \$199.00, SX-101A, HT-37, Hammarlund HQ-100 \$129.00, HQ-129 \$129.00, HQ-110 \$179.00, HQ-145 \$199.00, HQ-150 \$199.00, HQ-160 \$229.00, HQ-170 \$299.00; National NC-270 \$179.00, NC-183D \$199.00, HRO-50T1 \$199.00, NC-60, NC-173, NC-300, HRO-60, Central 20A \$159.00, 600L \$199.00; Collins 75A-2, 75S-1, 32S-1, KWS-1, KWM-2; Elmac, Globe, Gonset, Heath, Johnson, RME, other items. List free. HENRY RADIO COMPANY, Butler, Missouri.

WANTED: For personal use. Tektronix oscilloscope 531 or 535. John Nagle, 626 E. Main St., Moorestown, N.J.

TTY TD, built up, mxid head w/sync. motor. Not good looking but effective. \$75.00. Collins 32 V2 with FSK. \$235.00. Both F.o.b. S.F. W6MXJ, 436 Madrid St., S.F. 12, Calif.

QSTS, good to perfect condition. 1946 expc. until August. 1947 to 1956 inclusive, complete, well-packed, ready to ship, what are they worth to you? W6HOZ, 5218 Oaknoll, Los Angeles 43, Calif.

NATIONAL HRO-60 with A, B, C, D coils. 1-7-30 mcs. Exc. electrical, mechanical condx. Extremely clean appearance. Accessories: 100/1000 Kc. xtal calibrator, matching skpr, 15-meter AC coil manual, Heath Q-Multiplier, Orig. cost over \$700. Will sell for \$495. Mohawk Midgetape transistorized pocket tape recorder. Late model. Quality American construction. In exc. condx. Vx and pickup, intelligibility. Tapes play one hour, single battery. Wholesale \$1.80. Includes microphone/carbonate, battery, tape cartridge, internal power amplifier and skpr. Original cost \$280. Sell for \$180. Either item shipped prepaid (continental U.S.A.) upon receipt of certified check or m.p. A3C Ray Klaudi, AF 1969/366, Box C-366, Lowry AFB 30, Colorado.

HT33A, perf. condition, less than 200 total filament hours, brand new, unused, PL 172, \$550 cash or, preferably, trade on late model Viking Kilowatt. K8CFU.

FOR Sale: Hallicrafters S-85 with mounted S-meter, in vty good shape. \$80. Globe Chief transmitter, \$20. Screen modulator, \$7.00. Shumaker, Rt. 2, Box 205, Brookville, Ind.

EE's, James Biddle Midget Megger and case, new, \$80, or will trade for SB-10 or what? K7EML, Rt. 1, Box 163, Gold Hill, Oregon.

DX-40, like new. \$49. Roger, W1QAF, Box 157, Natick, Mass.

HQ-110C in new condx, not a scratch; Viking II with VOX provision and other neat modifications with microphone, instructions; Knight T50; ant. relay; Call Book; 75 and 40 mt. complete dipoles. Viking 122 VFO, mic, key, complete station. \$400. You pay shipping. Ready to go. Richard Lentini, K8UCU, 123 N. Huron St., Cheboygan, Mich.

SINGLE Sideband exciter, Central Electronics 20A, with QT-1 unit relay rack mounting, \$160. W6MCM, 210 Alden Rd., Hayward, Calif.

WANT FM car receivers 152-154 Mc. Tunable or fixed. Country fire department. D. J. O'Halloran, 13 N. Gore, Webster Groves, Mo.

WANTED: 4-1000A tube and socket. Bob Turner, W3RBW, Box 258, Accokeek, Md.

SELL: HRO-50T with speaker and xtal calibrator. In exc. condx \$195. K5LTO, 6988 Bob-o-Links, Dallas, Texas. TX 4-5969.

COLLINS T.C.S. transmitter and rcvr 12 volt pwr. supply, all cables, mike, remote control and mic in mint. condx, packed in 2 wooden export boxes: \$125.00 cash, 1 pr TS-100 cash powered phones, \$10; A-T-R inverter, 110 volt dc input to 110 volt AC rcvr. L. Loyd Roline, 2436 Carey Ave., Marinette, Wis.

TRADES Accepted: KWS-1, \$875; 75A2 w/cal. and A-4 knob, \$295; 75 ft. crank-up tower, \$80; 6 kc. filter for 75A-4, \$12; BC-453, \$10. Paul Schrader, WA6HQR, 7881 Vicksburg Ave., L.A. 45, Cal. Tel. OR 1-8543.

SELL: DX-100, SB-10, HRO-60, coils, 500 Kc to 30 Mc. crystal calib. and skpr, \$585. W3FGO, 2053 Springhouse, Broomall, Penna.

DX-40, \$45; QFI, \$6; Tecraft Falcon, \$100; Apelco AE17M marine phone, \$165; Apelco phone \$220. W0BPA, 2926 W. 24th St., Joplin, Mo.

FINAL pair 811's, 500 w., \$30; DX-35, VF-1, \$50; BC-342, Heath Q-Multiplier, \$50. In exc. condx. 38 Mead Lane, Westbury, L.I., N.Y. Tel. ED 4-5816.

HQ-170C guaranteed in beautiful condx. perf. operation. Asking \$339. F.o.b. Lubbock, Texas. DX-40, vty good, works perfectly. \$59.00. Shipped free. Certified check, etc. Other offers, trades possibly considered. Needed: buy, sell lists. K5ZOM, 1703 E. 46th St., Lubbock, Texas.

SELL: VHF station, \$430.00; Heath Seneca, \$180; HO100C, Johnson 6 and 2 converter, beam with AR-22 rotator. Special deal on complete station. Write for details. WAZHRF, 124 Audley St., New Gardens, N.Y.

BARGAINS! 20 meter, 3-element Telrex Deluxe beam, \$40; 40 ft. BC type steel tower, with safety guys and rotator mount, \$30.00; MB-150, \$12.50; Johnson 250-24 bridge, \$3.00; 250TH, \$10; 701-A's, \$5.00; 813's, \$5.00; 35T's, \$2.00. Misc. meters, tubes, etc. Requist Int'l, or highest bid takes. W4NBV, 4305 Landon Dr., Knoxville 21, Tenn.

SELL: Realigned NC-88, \$50.00. L. M. McGee, 58 Campus Dr., No. Buffalo 26, N.Y.

HALLICRAFTERS S53A, perfect, \$50; Philmore CR5AC, new, \$52.00. WAZNIM, 582 E. 42nd St. Brooklyn, N.Y. Tel BU 4-3516.

COMPLETE Rig for immediate sale. R-100 with accessories, DX-40, VF-1, D-104, 3-el. beam and accessories. Exc. condx. in use. First \$200 offer will be accepted. Also: K2POO keyer-monitor, \$20.00; Knight portable, \$15. Henry Adams, K4JYP, 315 S. Chapman, Greenboro, N.C.

NC-270 with matching speaker, new, only few hours' use, \$200; Heathkit Seneca, \$155; Ranger modified for SSB with SB10 or usual AM and CW, \$150.00. Pr 4-125A's, \$15.00. F.o.b. Riverdale, N.J. Ray Bunnell, K2CBO, 1 Evans Rd., Riverdale, N.J.

WANTED: Colling \$154, 5113 with manual. Also telescoping tower. Cash. Give full particulars. W1WLE.

THROUGH Roving, want to settle down. Will trade vty FB 1960 Zundapp "Super Sabre" motorcycle, 250 cc displacement, for amateur station, smlr factory-wired and in 20A. Ranger, Viking I class and rcvr in HQ-110, Drake LA or 2B, HP-50, SX-111 class; or for either xmit or rcvr. "S" line, SP-600, HQ-180, HRO-60, GPR-90. Pacemaker, HT-37 class, or what have you? All inquiries answered. K9KHU, 1408 Dial Court, Springfield, Ill.

FOR Sale: National NC-98 receiver with loudspeaker, \$70; like new, perfect working condx. Glenn Krueger, 377 Calumet Blvd., Harvey, Ill.

WANTED: KWM-2. State condx, price your first letter. C. Box 1, P.O. Box 422, Somerville, N.J.

LAKESHORE SSB Phasemaster 11B, Heath Mohawk receiver, \$225 each or both for \$425.00. Good condition, buyer pays shipping. C. Lee Gomez, P.O. Box 2088, Las Vegas, Nev.

FOR Sale: DX-40 w. VF-1, \$65; Globe LA-1 300 watts, \$80; HQ-110, \$180, in orig. carton, all in perf. condx. Dan Handelman, WAZBCB, 811 Walton Ave., Bronx, N.Y.

SWAP: Good Vidicon 6198A and 100 ft. new R252U aluminum coax 50 ohm; 2 G8U adaptors both ends. Coax is low loss hi power type. What have you? All letters? Wells Chapine, 942 Arden Lane, Birmingham, Michigan.

FOR Sale: HT32, \$395 and Collins KWM2 mobile mounting tray, \$75. W8BJS, 428 Roland, Grosse Pointe, Michigan.

FOR Sale: Viking Valiant \$300, HO100C w/skpr, \$160, D104 w/G stand, \$35; Vibroplex Bua, \$15, coax relay, \$5. All in excellent condition. Will sell complete, \$450. K9TDD, 1405 W. 75th Pl., Indianapolis, Ind.

SELL: Viking II, in exc. condx, \$160, George Kimeldorf, 214-15 82nd Ave., Queens Village 27, N.Y. Tel. SP 6-9060.

SELL: HT-31, \$145; AF67 with trans. pwr, \$40; PMR-7, 6-12 pwr, \$115; Super Pro 400SX, \$175; HC-10, \$90; RME 90711, \$60; 908R1 pwr. amp. with tunes and coils, \$55; Miller 2, 6, 10 convert, \$40; J. B. Forman, P.O. Box 2858 Grand Central Stn., N.Y. 17, N.Y.

SELL: HQ-170, like new, \$275. W8FDN, 412 Bayridge, Willowick, Ohio.

SUPER Selective I.F. described in QST Jan. 1957, and NC-300, both in superb condition. Inquire: E. Geitchell, Causeway St., Medford, Mass.

COLLINS KWM-2 (15 hrs) with 136B-2 Noise Blanker, 516F-2 (new), 516E-1 (15 hrs), 351D-1 rack, Collins 302C 1 wattmeter, MM-1 mike, custom Helwiphs for: 3980, 7250, 14.3 (6') 14.3 (4'), 21, 28.6, 29, 40.0 (noise blander) and two mobile base mounts. All for \$1495. All this installed in 1960 Chevrolet Impala base convertible, not a scratch and only 7550 mi. special generating equipment and absolutely no noise, \$2350 additional B&W L 1000A (with supply) and two extra 813's (new), \$295, Gonset IV Communicator (like new) plus in mike, stacked mobile helicals, fender mount, all cables, \$285. Colling 75S-1 perf. \$375.00 Want 4000w 6r 1 amp. variac controlled supply. Will sell. John F. Ashton, 12 Top O'Hill Rd., Darien, Conn. DA 5-2125.

SELL, exlnt condx, like new. National NC-125, skpr. WA6MWA, 1224 Lester St., Bakersfield, Calif.

SX-110 in AAA-1 condx. Used only a few hours, \$135. Need the money for college. K8HJI.

NEED Harvey-Well's TB550. Have RTTY printer equipment. W7CBY.

WANTED: Model 15 or 19 metal Teletype table, Model 19 keyboard for cash or swap other teletype equipment or Hi-Fi parts. W4NZY, 119 North Birchwood Ave., Louisville 6, Kentucky.

COLLINS 516 E-1 12 volt D.C. supply. Converted to positive ground. Easily reconvert. All data supplied. New condition and appearance. W1HAC, R. C. Benson, 348 Woodbridge St., Manchester, Conn.

VIKING Ranger, \$169. DX-40, \$49. Both gud. Clayton, 4236 W. 36th, Cleveland 9, Ohio.

RME 4350A, \$145; HT-37, \$375; 75S1 with 10-meter xtals, \$435; 600L linear, \$275; 600 watt AM, all bands, \$150. W2ELU, Evans, 25 East St., Skaneateles, N.Y.

NATIONAL NC-98, Heath Sixer and VTVM for sale. For info: K8JUL, 727 Del Centro, Los Altos, Calif.

GORDON Roto-beam rotator, Anten-a-rotor, station control and 2 band antenna system. In use for about a year and then stored until now. Complete \$200 or rotator and indicator only \$150. W1RMS, 198 Euclid Ave., Waterbury, Conn.

SELL: Gonset Communicator IV, 144 Mc., used one hour, \$15. 5 pairs, \$275; grounded grid pwr. amplifiers described in May QST and July QST. Johnson Kilowatt, 1A rotocool, \$20. W6HNN, 3467 Rambow, Palo Alto, Calif.

CLEANUP Bargains: 400-watt transmitter, \$100; 200-watt unfinished transmitter, \$40; old HRO rev. \$25; Meissner VFO, \$18; DX20, \$20; Verane, K2GU, 420 Riverside, N.Y. 25, N.Y. Tel. MO 6-8513.

POLAROID Camera kit, like new. I will swap it for any of the following: home or mobile ham gear, citizens gear, 110 volt gasoline generator, tape recorder, or camping equipment. Peter Boudreau, 10 Forbes Ave., Burlington, Mass.

COLLINS Receiver 75A1 with manual and matching spkr. Exc. cond. \$225. Kenneth Engstrom, WSCUM, 833 Oak Forest Dr., Dallas 32, Texas.

SALE: SSB 20A w/458VFO 837 final, hvy duty variac 0-1400 pwr. supply, \$165. Cash and carry. W2VFW, Millburn, N.J.

VIKING Valiant, \$300; Chalkner, \$100; Knight R-100 revr, S-meter, spkr, \$90, all in exc'l cond. w/manuals. F.o.b. Greeley, Colo. 2431 25th Avenue. K0WOP.

WIRED & Tested Heathkits and Knight-kits: "Pawnee" or "Shawnee" transceiver, \$289.95; "Seneca", \$210.50; "Twoer" transceiver, \$69.95; and others. Nrite C-V Electronics, 3138 Bougainvillea Street, Sarasota, Fla.

75A4 Serial 5249 with 3.1 and 6 Kc. filters, \$600; Central Electronics 100V, \$550 inc. shipping. K6HAH, \$33 Valverde, South San Francisco, California.

COMPLETE 6-800 mobile station sale: Multi-Elim AF-68, Gonset G-66B, Multi-Aimac power supply M-1070, Tecraft M-6 converter M-6, Dow-Key coaxial relay, Saturn-6 halo, Mosley Tri-band whip MA-3 Electro-Voice microphone, gud, cables and instrum manuals, \$375 or your best offer. K2KRO, 1216 N. Cicero Ave., Chicago 41, Illinois. Phone AVenue 3-3100.

WANT: CDR Ham-m or Hy-Gain rotor. Sell new Johnson KW matchbox, \$90. Paul Bittner, W0AIIH, Stewartville, Minn.

SELL: One new TH-4 Thunderbird Tribander, \$75. Ted Cliff, W9ET, R 23, Box 171-D, Terre Haute, Ind.

TMC GSB-1 Sidebander adaptor. New condx, \$100 F.o.b. New Orleans. W3M6, 3409 Beaulieu St., Metairie, La.

HIGHLY Effective home-study review for FCC commercial phone exams. Free literature. Wallace Cook, Box 10634, Jackson, Mich.

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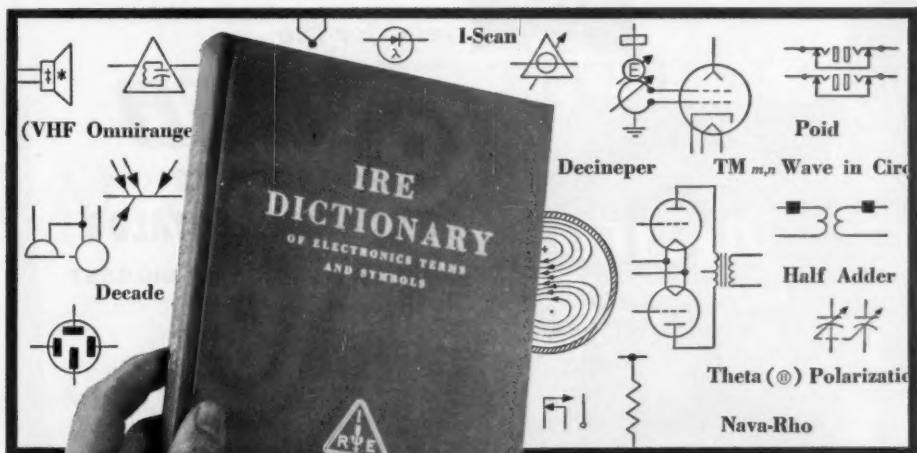
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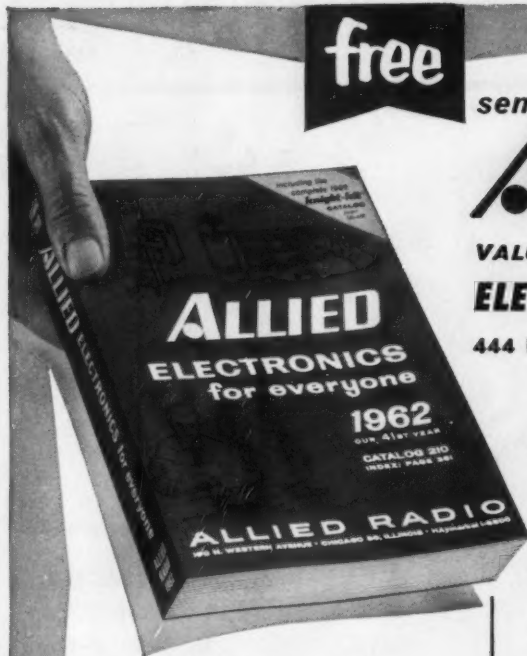
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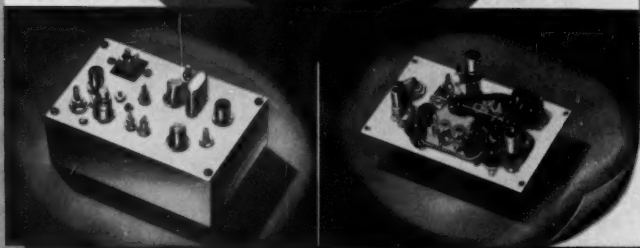
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